



School of Health + Science

Safe Work Practice Sheets



Note:

In most cases the majority of hazards can be controlled by adhering to procedures detailed in the below School **Safe Work Practice Sheets (SWPS)**. These are developed on an as needed basis as identified through the regular risk assessment process, and are available in the School Administrative offices and all Research Centres. The list of these SWPS is also included in Appendix IV of the School Ancillary Safety Statement. More generic college-wide SWPS are also to be adhered to and are available at:

<https://www.dkit.ie/health-safety/safety-statements/routine-safe-work-practice-sheets>

The SWP were originally prepared in 2011 and were reviewed by the FASC during the 2016/2017 academic year. Only editorial/legislative updates were made.

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REDUCTION AND DISPOSAL OF HAZARDOUS WASTE	Ref: SWPS030	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Note

The School of Health and Science can be inspected at any time by the relevant authorities, e.g. Health and Safety Authority and Environmental Protection Agency for compliance with the Safety, Health & Welfare at Work Act, 2005 and other relevant legislation.

Amounts of chemical and solvent waste should be minimised by miniaturisation of the experiments and ordering only quantities of chemicals that will be totally used by the laboratory within 5 years. There are exceptions to this, see peroxide forming materials.

General**1.0 Labelling**

All hazardous waste containers must have a label that states Hazardous Waste, and must list the constituents of the waste. The labelling must be done when waste is first placed into the container. When naming the waste, be specific (e.g. xylene instead of non-halogenated solvents and ethanol instead of alcohol). Do not use abbreviations or chemical formulas. Waste is also divided into two classes chlorinated and non-chlorinated and must be labelled as such. Hazardous waste labels are available from the technical staff (see Figure 1 for copy of waste labelling).

1.2 Containers and Storage

The person who generates the waste must provide proper containers for accumulating and storing hazardous waste. Generally, the best containers for hazardous waste are the ones that the materials come in e.g. Winchesters. All containers must have tight fitting lids. Corks, ground glass stoppers or parafilm are not proper substitutes for a tight-fitting lid. Unacceptable containers or containers without tight-fitting lids will not be disposed of by the technical personnel and it will be the responsibility of the generator to transfer the material to another container or to provide a proper lid for the container.

At no time can more than 5 litres of waste be allowed to accumulate in any lab or storage area, prior to its removal to the outside solvent storage area. When the waste generator has a full container of waste, a waste label should be completed and attached to the container and given to the technical staff in

charge of waste.

N.B. Waste should be stored in a solvent cabinet or in the ventilated cabinets under the fume hoods.

Incompatible materials, either waste or unused chemicals, should never be mixed. Incompatible materials when mixed together may cause explosions, fires or may generate flammable or toxic gases resulting in serious health hazards, if in doubt do not mix. Caution must be exercised in any area where chemicals or wastes are stored to ensure incompatible materials are segregated appropriately. Segregate chemical/solvent waste by hazard class. Flammable waste should be kept away from heating sources.

Examples of chemicals that should not be stored together, as they are incompatible are:

- Oxidizers with flammables
- Elemental metals are incompatible with hydrides
- Acids are incompatible with cyanides
- Acids are incompatible with sulfides
- Acids are incompatible with bases
- Acids are incompatible with flammables
- Acids are incompatible with chlorine compounds
- Acids are incompatible with alcohols
- Acids are incompatible with elemental metals
- Amines are incompatible with chlorine compounds
- Water or air reactive chemicals are incompatible with anything
- Organic peroxides are incompatible with anything
- Phenols are incompatible with formaldehyde
- Sodium azide is incompatible with aqueous lead

This is not an exhaustive list. You should always consult a Material Safety Data Sheet (MSDS) or other chemical information sources such as the Merck Index for compatibility information.

Halogenated waste materials (those containing halogen compounds such as chlorine or fluorine) should be separated from non-halogenated compounds, unless unavoidable. This is for safety and economic reasons. The halogenated wastes, while much less flammable, are generally more toxic than non-halogenated waste materials.

Where possible, mercury compounds should be eliminated from the laboratory. It is very important not to mix mercury with other materials due to difficulty (and cost) of disposing of mercury compounds. A mercury spill kit is available from the technical staff and should be on hand where mercury is used.

If there are queries regarding dangerous or incompatible materials these will be handled on a case-by-case basis by the laboratory supervisor.

1.3 Disposal of Hazardous Waste

To dispose of any hazardous waste you must completely fill out a hazardous waste form for each container (Figure 1). These are obtained from the preparation room.

1. The person who generates the waste (e.g. researcher or lecturer supervising undergraduate practical) should fill out the hazardous waste form and attach it to the container.
2. Hazardous waste must be divided into chlorinated or non-chlorinated waste.
3. Do not use chemical formulas or abbreviations.
4. Use chemical names for waste constituents.
5. All liquids should be brought to pH 7.
6. Information should be printed and be legible.
7. One form should be filled out for each container.
8. Containers must also be labelled with a hazard-warning symbol.
9. For animal carcasses, one form is needed for each bag or box.
10. No waste materials will be disposed of without properly filling out a hazardous waste form.

N.B. The Institute is required by law to track its hazardous waste from the point it becomes a waste to its point of ultimate destruction (Waste Management Act, 1996).

1.4 Pharmaceuticals and Controlled Medications

Pharmaceuticals, chemotherapy agents and other controlled medications should be managed in the same manner as any other hazardous waste. When filling out the hazardous waste disposal form, be sure to list both the common trade name and the more definitive chemical name. Any additional information available about the substance should be written on the waste disposal form.

1.5 Ethers and Peroxide-Forming Materials

Some chemicals such as old ethers (not petroleum ether), picric acid, and organic peroxides tend to form unstable (explosive) compounds. Over time they can become extremely unstable. If peroxide formation is suspected, the containers should be isolated and the technical staff notified. Under no circumstances should staff attempt to open containers if crystal formations are visible in the container. It is recommended that researchers mark their containers with the date that the container was received and opened. Peroxide-forming materials that will not be used up or are not needed should be disposed of six months prior to the expiration date on the containers.

1.6 Dilute Solutions of Non-Toxic Aqueous Chemicals

Very dilute solutions ($\leq 1\%$) of non-toxic aqueous Chemicals may be disposed of down the fume hood sinks only

Figure 1: Hazardous waste form (orange labels with black writing)



**HAZARDOUS WASTE DISPOSAL PROFILE
SCHOOL OF HEALTH AND SCIENCE
DUNDALK INSTITUTE OF TECHNOLOGY**

Complete this form for each container of hazardous waste.

All constituents must be identified.

Securely stick this label to the container and hand a copy to the technical staff.

NAME: _____ **Date:** _____

DEPT. _____ **ROOM.** _____ **PHONE:** _____

List all constituents in the container

_____ %

_____ %

	_____ %
	_____ %
	_____ %
	_____ %
Total	_____ %
Amount of waste in container (max 2 Litres)	_____
WASTE CHARACTERISTICS (CIRCLE ALL THAT APPLY)	
Flammable Corrosive Toxic Biological Explosive Environmental	
Special Notes:	
.	
<u>Further Information</u>	
<ul style="list-style-type: none"> • Safety, Health & Welfare at Work Act, 2005, Government Stationary Office, Dublin. • Waste Management Act, 1996, & Amendment Act, 2001, Government Stationary Office, Dublin. • Merck Index, (2001), 13th Ed., Merck and Co. Ltd., Whitehouse Station, N.J. • Furr, A.K. (Ed.) (2000). Chemical Wastes. In <i>CRC Handbook of Laboratory Safety</i>, 5th Ed., CRC PRESS, INC., pp 255-260 	

HANDLING AND USE OF CHEMICAL AGENTS	Ref: SWPS031	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

In DKIT workplaces where chemical agents are used all persons in the vicinity of the chemicals are at risk of exposure to the chemicals. In some cases incorrect use can generate spillages and fires which can place other persons in the building at risk.

Description

Working with chemical agents can leave persons exposed to the hazards posed by those chemical agents. These risks can be exacerbated when differing chemical agents come into contact with each other. The risks posed by chemical agents are varied. The risk control measures outlined below are for general guidance purposes only.

General

The ultimate aim when designing safe systems of work for the use of any chemical agent is to eliminate or to reduce to as low a level as possible exposure of any person to that agent and to ensure that the agent is used in such a manner such that it does not pose a risk to the user or any third party, e.g. through the generation of fire, explosion, etc. To achieve these objective there are a number of general safety rules that should be followed at all times when working with chemicals:

1. When handling any chemical agent a *Material Data Safety Sheet* must be readily available for consultation as required. Users should make themselves aware of the properties of each chemical that they use.
2. The use of every chemical agent should be subjected to a *Chemical Agents Risk Assessment*.
3. No more than one day's supply of any chemical should be stored at the bench or outside of designated storage cabinets.
4. Work processes must be designed so as to minimise the amount of contaminants given off.
5. Where a large amount of chemical contaminants are to made airborne then a process must be undertaken in a fume hood
6. Chemical agents must not be allowed to come into contact with the user's skin. Suitable PPE must be worn at all times. At a minimum a lab coat, safety glasses and gloves must be worn at all times when handling any chemical agents.
7. Pregnant and breastfeeding women must not work with any chemical agents unless a full risk assessment has been undertaken.

8. Persons working with any chemical should be aware of the symptoms of exposure to that agent and cease work immediately if they develop any of the symptoms. Persons should also be vigilant for the development of such symptoms in co-workers.
9. When working with flammable chemicals as many potential sources of ignition as possible must be removed from the immediate area.
10. Chemicals should be stored in air tight containers.
11. All chemical storage containers must be labelled as to their contents.
12. There must be no eating or drinking in the chemical laboratory.
13. Users should wash their hands following the handling of any chemical and prior to eating or drinking.
14. Bottle carriers should be used for transporting glass bottles.
15. When not in use containers should have their lids replaced.
16. Lone working with chemicals should be avoided unless shown to represent a low risk to the user's safety.
17. A high standard of housekeeping must be maintained in the laboratory at all times.
18. All chemical waste must be disposed of in a suitable manner.

Further Information

DISPOSAL OF CHEMICALWASTE	Ref: SWPS032	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

The EC and Local Authorities have laid down strict guidelines for the safe disposal of waste. These regulations are being constantly updated and laboratory personnel should pay particular attention during the disposal of waste. Chemical storage should be reviewed every five years. Only buy chemicals in small quantities, as disposal of unused or unknown waste chemicals is extremely costly. Full containers of correctly treated and labelled waste should be given to the technical staff. The waste will then be stored in the outside waste solvent store, to await collection and disposal.

General

There are seven categories of chemical waste in the School and these are:

1. Non-chlorinated solvent waste.
2. Chlorinated solvent waste.
3. Unused Laboratory Chemicals.
4. Hazardous waste - known components.
5. Hazardous waste - unknown components.
6. Dilute aqueous non-toxic waste.
7. Organic waste and micro-organisms

All waste should be labelled correctly and stored in labelled Winchesters in fume hoods or ventilated presses. Ensure any under labels or labels chemical name are removed prior to labelling with Waste Label and that Waste label is securely attached.

The disposal of laboratory waste should only be done in the following manner:

2.1 Non-chlorinated Solvent Waste

This must be labelled clearly. The label must include the category of waste, , and the person's name, lab identification and constituents. Ensure previous labels have been removed. (see SWPS 030 Fig. 1) . Do not mix chlorinated and non-chlorinated waste. This is then disposed of through a contracted

company.

2.2 Chlorinated Solvent Waste

As for non-chlorinated. Do not mix chlorinated and non-chlorinated waste.

2.3 Unused Laboratory Chemicals

If chemicals are not hazardous they can be thrown out provided the label is removed and the top is removed from the chemical container

2.4 Hazardous waste – Known Compounds

This category can be added to either chlorinated or non-chlorinated waste respectively. If a component is incompatible then it should be clearly labeled and kept separate. If there is a mixture of chemicals then each component should be named and the concentration indicated on the label (see labels in Figure1, Section 2.1). Some chemicals such as Ethidium bromide can be neutralized or treated. Powdered chemical waste in their original containers should be catalogued with its chemical name and amounts. These waste chemicals should be given to the technical staff along with the catalogue.

2.5 Hazardous Waste – Unknown Compounds

Label the container clearly with the persons' name. Include on the label the estimated amount left in the container and any other information that might be relevant.

2.6 Dilute Aqueous Waste

Very dilute solutions of aqueous non-toxic/non hazardous waste may be disposed down the drain in the fume cupboard sink.

2.7 Organic Waste Containing Micro-Organisms

Solutions containing organic solvents and micro-organisms, e.g. from fermentations, should be disposed of through a licensed waste chemical contractor. These liquids cannot be autoclaved due to the content of organic solvents. Please contact technical staff if you are generating this combination of waste.

2.8 Disposal of Containers with Waste

Inform the appropriate technician in the prep. lab and they will advise where and how to manage the disposal of the waste. Under no circumstances should waste be left in the Prep Room without informing the Technicians in charge.

2.9 Disposal of Empty Containers

Small contaminated glass containers can be disposed in the yellow 'contaminated sharps' bins. Winchesters should be empty and rinsed with water 5 times, the label can be removed and the container can be reused. Glass and pyrex containers can be disposed of by placing in a glass recycling container in the preparation room. Plastic containers should be emptied and rinsed 5 times in water and

the label removed. The container can then be safely disposed in the bin.

2.10 Minimization of Waste

Chemical waste is hazardous to the environment and disposal is very expensive. Chemical waste can be minimized by reducing assay volumes, e.g. reducing an assay volume by half and using a micro cuvette (1.5ml) instead of a 3ml cuvette. Assays may be converted by using 96 well microtitre plates, which will reduce assay volumes to 200 μ l.

Further Information

http://www.hsa.ie/eng/Your_Industry/Chemicals/

CHEMICAL STORAGE AND INVENTORY CONTROL	Ref: SWPS033	Approved by: FASC Feb 2011
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Hazards

- Fire
- Explosion
- Uncontrolled dispersal of materials
- Violent polymerization

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Adverse hazardous chemical reactions can occur when incompatible materials mix because of accidental breakage, fire, container failure and through mixing of gases or vapours from loose lids on containers.

General***Precautions for Storing Dangerous and Reactive Substances***

Keep the laboratory chemical inventory to a minimum and do not store excess quantities of any hazardous substance. Chemicals should be kept and stored as recommended by the manufacturer. Hazardous chemicals must have a risk assessment completed, signed and given to the Head of Department before ordering as per safe work practice sheet , "Biological and Chemical Risk Assessment". An inventory of hazardous chemicals is maintained by the technical staff. The inventory should be communicated to the Head of School and Estates Office annually. Risk Assessments are kept on file in the Science Office.

Separate all chemicals according to the guidelines for storing dangerous and reactive substances. Store hazardous chemicals separately in ventilated, labelled, secure cabinets/rooms.

Chemicals that are radioactive must be stored and controlled in accordance with the RPII license conditions.

Containers must be in good condition and compatible with its contents. Degraded, missing label, spilled or leaking containers must be disposed of in a safe manner, see safe work practice sheet , "Disposal of Chemical Waste".

All containers must be legibly labelled with chemical name, concentration, and a hazard warning symbol.

Peroxide formers and other chemicals that degrade over time must be dated when received and opened and disposed of within 1 year or tested for the presence of organic peroxides, see safe work practice sheet 030.

Store hazardous chemicals/materials as low down as possible in case they fall.

Do not keep flammable materials in a domestic refrigerator; use a flammable storage refrigerator as the spark generated when the door is opened can ignite the flammable materials.

Explosive substances, or substances used to make explosives, e.g. nitrates, cannot be stored in DkIT without a "Police Certificate for Keeping Explosives for Private Use".

Material Safety Data Sheets (MSDS) should be available for each chemical in the laboratory, see safe work practice sheet 034, "Material Safety Data Sheet"). The MSDS will give the user the information to work with the chemical safely. MSDS's should be acquired and kept by the user, i.e. researcher or lecturer supervising undergraduates. Copies of all MSDS's in use in the Department must be kept in the MSDS file kept by the Senior Technical Officer and stored in the Preparation Room. Some MSDS's may only be valid for as little as three months.

Excess chemicals should be disposed of according to safe work practice sheet 032, "Disposal of Chemical Waste". See also safe work practice sheet 030 "Procedure for the reduction and disposal of hazardous chemical waste"

Do not store solvents or waste solvents in direct sunlight as the bottle may break and spill its contents.

3.4 Practical List of Incompatible Chemicals (Reactive Hazards)

Substances in the left hand column should be stored and handled so they cannot possibly accidentally contact corresponding substances in the right column under uncontrolled conditions, when violent reactions may occur.

Acetic Acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides and permanganates
Acetic anhydride	Hydroxyl-containing compounds such as ethylene glycol, perchloric acid
Acetone	Concentrated nitric and sulphuric acid mixtures, hydrogen peroxide
Acetylene	Chlorine, bromine, copper, silver, fluorine and

	mercury.
Alkali and alkaline earth metals, such as sodium, potassium, lithium, magnesium, calcium, powdered aluminium.	Water, Carbon dioxide, carbon tetrachloride and other chlorinated hydrocarbons. (Also prohibit water, foam and dry chemical on fires involving these metals – dry sand should be available).
Ammonia (anhyd.)	Mercury, chlorine, calcium hypochlorite, iodine, bromine and hydrogen fluoride.
Ammonium nitrate	Acids, metal powders, flammable liquids, chlorates, nitrites, sulphur, finely divided organics or combustibles.
Aniline	Nitric acid, hydrogen peroxide.
Azides	Acids, heavy metals and their salts, oxidizing agents
Bromine	Ammonia, acetylene, butadiene, butane and other petroleum gases, sodium carbide, turpentine, benzene and finely divided metals.
Calcium oxide	Water
Carbon, activated	Calcium hypochlorite, all oxidising agents
Chlorates	Ammonium salts, acids, metal powders, sulphur, finely divided organics or combustibles.
Chromic acid and chromium trioxide	Acetic acid, naphthalene, camphor, glycerol, turpentine, alcohol and other flammable

	liquids.
Chlorine	Ammonia, acetylene, butadiene, butane and other petroleum gases, hydrogen, sodium carbide, turpentine, benzene and finely divided metals.
Chlorine dioxide	Ammonia, methane, phosphine and hydrogen sulphide
Copper	Acetylene, hydrogen peroxide.
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens and oxidizing agents
Fluorine	Isolate from everything.
Hydrazine	Hydrogen peroxide, nitric acid, any other oxidant.
Hydrocarbons (benzene, butane, propane, gasoline, turpentine etc.)	Fluorine, chlorine, bromine, chromic acid, peroxide
Hydrocyanic acid	Nitric acid, alkalis
Hydrofluoric acid, anhyd. (Hydrogen fluoride)	Ammonia (aqueous or anhydrous).
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, any flammable liquid, combustible materials, aniline, nitromethane.
Hydrogen sulphide	Fuming nitric acid, oxidizing gases.

Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (anhydr. or aqueous).
Mercury	Acetylene, fulminic acid*, ammonia.
Nitrates	Acids
Nitric acid (conc.)	Acetic acid, acetone, alcohol, aniline, chromic acid, hydrocyanic acid, hydrogen sulphide, flammable liquids, flammable gases and nitratable substances., copper, brass and heavy metals
Nitrites	Acids
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury and their salts
Perchloric acid	Acetic anhydride, alcohol, bismuth, paper, wood, grease, oils,
Permanganates	Conc sulphuric acid, glycerol, ethylene glycol, benzaldehyde
Phosphorus (white)	Air, oxygen,alkalis, reducing agents
Potassium chlorate	Acids (see also chlorates).
Potassium perchlorate	Acids (see also perchloric acid).
Potassium permanganate	Glycerol, ethylene glycol, benzaldehyde, sulphuric acid
Silver and silver salts	Acetylene, oxalic acid, tartaric acid, fulminic acid*, ammonium compounds.

Sodium	Water See alkali metals (above).
Sodium nitrite	Ammonium nitrate and other ammonium salts.
Sodium peroxide	Any oxidizable substance, such as ethanol, methanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerol, ethylene glycol, ethyl acetate, methyl acetate and furfural.
Sulphuric acid	Chlorates, perchlorates, permanganates

* Produced in nitric acid – ethanol mixtures.

3.5 Practical List of Incompatible Chemicals (Toxic Hazards)

Substances in the left hand column should be stored and handled so they cannot possibly accidentally contact corresponding substances in the centre column because toxic materials (right hand column) would be produced.

Arsenical Materials	Any reducing agent*	Arsine
Azides	Acids	Hydrogen azide
Cyanides	Acids	Hydrogen Cyanide
Hypochlorites	Acids	Chlorine or hydrochlorous acid
Nitrates	Sulphuric acid	Nitrogen dioxide
Nitric acid	Copper, brass, any heavy metals	Nitrogen dioxide (nitrous fumes)
Nitrites	Acids	Nitrous fumes
Phosphorous	Caustic alkalines or reducing	Phosphine

	agents	
Selenides	Reducing agents	Hydrogen selenide
Sulphides	Acids	Hydrogen sulphide
Tellurides	Reducing agents	Hydrogen telluride
<p>* Arsine has been produced by putting arsenical alloy into a wet galvanized bucket.</p>		
<p><u>Further Information</u></p> <p>Guidelines for Storing Dangerous and Reactive Substances:</p>		

SAFETY DATA SHEETS	Ref: SWPS034	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

MSDSs provide useful information on chemicals, describing the hazards the chemical presents, and giving information on handling, storage, and emergency measures in case of an accident

General**A MSDS must be:**

- prepared by a competent person
- in official language of Member State
- in required 16 heading format
- specific to the chemical
- clear and understandable
- provided free of charge on paper or electronically
- provided no later that at time of first delivery
- updated when new information on the chemical becomes available or when an authorisation is granted or refused or a restriction is imposed under REACH
- provided upon updated or revision to everyone who has received the chemical during the previous 12 months
- dated and the pages numbered

However, the manufacturer or distributor is not required to send MSDSs with subsequent orders of the same product to DKIT. MSDSs received by the Department are filed by the Senior Technical Officer and stored in the Preparation Room.

Each user* of a biological agent or chemical is responsible for keeping their own updated MSDSs. These may be available from the Senior Technical Officer file but MSDSs for some chemicals may not be available in which case the user* is responsible for obtaining them. Ideally, the MSDS should be consulted before requesting the chemical as safer alternatives should always be considered.

*researcher, postgraduate student or lecturer supervising undergraduate project or practical class.

Further Information

A glossary of terms appearing in an MSDS can be obtained at www.ilpi.com/msds/ref/index.html

Some online sources of MSDS:

www.sigma-aldrich.com

www.piercenet.com

www.lennox.ie then select MSDS – Merck products only

Appendix 1

16-Heading SDS

The 16-heading SDS contains the following information:

1) Chemical Product and Company Information

Product Name

Name of the product that matches the supplier label.

Supplier Name

Name, address and telephone number of the supplier.

Validated/Preparation Date

Must not be older than three years. May also be found under **Other Information**.

Product Uses

Describes what the product is used for. If you wish to use it for other purposes, or product use is not indicated contact your supervisor for clarification.

Product Classification

Indicates WHMIS class that the product belongs to. May also be found under **Regulatory Information**.

2) Composition/Information on Ingredients

Percent make-up of all hazardous ingredients will be listed here.

3) Hazard Identification

Provides an overview of known health effects. Details can be found in **Toxicological Information**.

4) First Aid Measures

Describes first aid or medical treatment if exposure occurs.

5) Fire-Fighting Measures

Details fire fighting methods, extinguishing media and hazardous products of combustion. Flammability data such as flash point, explosive limits and autoignition temperature will also be listed here.

6) Accidental Release Measures

Provides information on how to clean up spills or accidental releases of hazardous materials.

7) Handling and Storage

Describes safe handling procedures to minimize exposure to hazardous materials and identifies incompatible storage conditions to be avoided.

8) Exposure Controls, Personal Protection and Exposure Limits

Contains recommendations that will help to make the working environment safe such as proper ventilation. Also lists the proper protective equipment that must be worn, such as gloves, eye protection, etc.. Exposure limits as established by various independent and regulatory agencies may also be found in this section.

9) Physical and Chemical Properties

Details about the unique properties of the hazardous material can be found here to help determine safe handling procedures.

10) Stability and Reactivity

Information regarding the material's reactivity with other materials and what changes can occur during storage.

11) Toxicological Information

Provides information about the toxicity of the material and results of toxicity studies regarding the various routes of entry.

12) Ecological Information

Describes what effect the material may have on the environment and assist in determining proper disposal procedures.

13) Disposal Considerations

Provides information regarding treatment, recycling and disposal methods.

14) Transport Information

Information regarding transport regulations such as TDG class, packing group, PIN numbers and other special considerations when transporting the material.

15) Regulatory Information

This section lists applicable governmental regulations that pertain to the product. Various international regulations may also be found here.

16) Other Information

Additional information regarding the material may be found here such as references and contact information if the MSDS was prepared by an agency other than the manufacturer or supplier.

ETHIDIUM BROMIDE WASTE REDUCTION AND DISPOSAL	Ref: SWPS035	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Ethidium bromide is widely used for visualization of nucleic acids in electrophoresis gels. Ethidium bromide is a potent mutagen and is toxic.

General**5.1 Current Methods for Disposing of Ethidium Bromide**

There are two current methods for disposing of Ethidium bromide. The first method or method 1 is recommended for dilute, aqueous solutions containing Ethidium bromide such as electrophoresis gel staining buffer. This method reduces the volume of waste by binding the chemical to a filter, and the filtrate can be safely poured down the drain. The filter is capped and kept for removal by a licensed waste contractor. The second method deactivates the Ethidium bromide chemically and the liquid can then be poured down the drain, using excess water to dilute.

5.2 Method 1 (Schleicher & Schuell Extractor):

1. Place the extractor unit on to a sturdy, suitable vessel to which a seal will form when a vacuum is applied as per manufacturers' instructions.
2. Attach a vacuum pump to the nozzle of the extractor unit.
3. Turn on the vacuum.
4. Fill the extractor funnel to the 500 ml maximum level with liquid Ethidium bromide waste.
5. When all waste has been filtered turn off the vacuum.
6. This process is repeated until a maximum volume of 10 litres is filtered per extraction funnel.
7. The filtrate is disposed down the drain.
8. The filtrate can be assayed for residual Ethidium bromide.
9. The filter can be disposed of as solid Ethidium bromide waste.

5.3 Method 2:

1. To 500 ml of liquid Ethidium bromide waste add 100 ml of 5% hypophosphorus acid.
2. Add 60 ml of 0.5 M sodium nitrate.
3. Stir briefly.
4. Allow to stand for approximately 20 hours.
5. Adjust the pH to approximately 5.0 with solid NaHCO₃ using pH paper.
6. Once the desired pH has been acquired, wash down the drain with excess water.

5.4 Solid Ethidium Bromide Waste

Solid Ethidium bromide waste such as gels, gloves, paper towels etc. should be placed in the cytotoxic waste bins provided. A member of the technical staff will remove the waste bins when full and subsequently a licensed waste contractor will remove them for disposal.

Further Information

[http://rehs.rutgers.edu/pdf_files/Electrophoresis-SOP-2-2-09%202 .pdf](http://rehs.rutgers.edu/pdf_files/Electrophoresis-SOP-2-2-09%202.pdf)

Biological and Chemical Risk Assessment	Ref: SWPS036	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Risk assessment information, template and example for use of Biological or Chemical agents

General**Ordering of Hazardous Biological or Chemical Agents**

The relevant Safety Data Sheet (SDS) must be consulted to gain the hazard information required to complete the risk assessment as needed for that chemical or biological agent. SDSs are obtained from the web sites of the different companies (see SWPS034).

Order only quantities of hazardous chemicals, which you will use within a period of a year, even if the chemical is less expensive in larger quantities. Bear in mind, those hazardous chemicals have very high disposal costs. Each chemical brought into the school should be dated when opened.

Chemicals that arrive in the School will be entered into the Chemical list database maintained by the technical staff.

Risk Assessment Template :

1. **Date:**

2. **Name of Laboratory & room no.:**

3. **Biological / Chemical Agent:**

(Name, Supplier, Cat. No. and Quantity)

4. **Outline of procedure where the biological/chemical agent is used and the concentrations**

used:

5. Hazards (Please tick appropriate label and strike out any not applicable):

Read MSDS (Material Safety Data Sheet) to obtain hazard information.

Chemical Agent Solid Liquid or Gas

Biological Agent Class 1 2 3 or 4

Cell culture Tissue/s Microorganism

Type of hazard (Toxic, corrosive, irritant etc.):

Risk Phrases:

Storage:

Disposal:

Residual Hazards (i.e. hazards still remaining):

6. Existing Controls (query their adequacy/suitability):

7. State amount of time working with this agent under controlled conditions. ...

8. State Occupational Exposure Limit Value [OELV]).....

9. Safety phrases:

10. What can be done to eliminate the risk altogether, or substantially reduce it?

11. Quantify the risks of injury, disease and other loss from these hazards. (Rating the severity of the risk against the likelihood of its occurrence).

Low ____ Medium ____ High ____

Low: Where the probability of an accident is low and the severity of the accident would be minor.

Medium: Where the probability of an accident occurring is possible and the severity of the accident would be serious.

High: where the probability of an accident occurring is high and the severity of the accident is very serious.

12. Are risk control measures in place?

13. State spill control procedure

14. Record the findings and use the records as part of the review process. Create an assessment file for your project and keep in a set location.

14. Monitor the measures i.e. review quarterly.

SIGNED: _____ DATE: _____

ASSESSOR

SIGNED: _____ DATE: _____

SUPERVISOR (where relevant)

SIGNED: _____ DATE: _____

Head of Department or Head of School

Further Information**Example of Specimen completed Risk Assessment:**

1. **Date:** 30-1-02

2. **Laboratory:** XG 51, Teaching Lab.

3. **Biological/ Chemical Agent Name:** Acrylamide/Bis-Acrylamide 30%, Cat. No. A 3699 Sigma 100g (quantity ordered).

4. **Outline of procedure where the biological/chemical agent is used and the concentrations used:** SDS gel electrophoresis, preparation of gel. Stock solution concentration 30%. Upper gel concentration 3%. Lower gel 10%

5. **Hazards** (Please tick appropriate label and strike out any not applicable):

Read MSDS (material safety data sheet) **to obtain hazard information.**

Chemical Agent solid Liquid

Type of hazard (Toxic, corrosive, irritant etc.): Toxic, May cause cancer, May cause heritable genetic damage. Also, harmful by inhalation and in contact with the skin. Toxic if swallowed. Irritating to the eyes and skin. May cause sensitization by skin contact. There is a danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Possible risk of impaired fertility.

Risk Phrases: R 45 (may cause cancer), R 46 (may cause heritable genetic damage).

R 20/21/22 (Harmful by inhalation and in contact with the skin and if swallowed). R25 (toxic if swallowed). R36/38 (irritating to the eyes and skin). R43 (may cause sensitization by skin contact). R 48/23/24 (toxic: danger of serious damage to health by prolonged exposure through

inhalation, and in contact with skin. R62 (possible risk of impaired fertility).

Storage: Fridge, Secure.

Disposal: Solutions can be mixed with combustible solvent and incinerated.

Residual hazards: (i.e. hazards still remaining): Operator should work in a safe manner. Nitrile gloves should be used instead of latex.

6. Existing Controls (query their adequacy/suitability): 1. A fume hood should be used when preparing solutions. 2. Wear safety goggles, white coat, gloves at all times. Latex gloves are only splash resistant and should be discarded immediately upon splash contamination. Nitrile gloves offer a better level of chemical protection. Hands should be washed after working with a chemical.

7. State the amount of time spent working with this agent under controlled conditions.... Actual time working with chemical 10-15 mins.

8. State Occupational Exposure Limit Value [OELV].....OELV = $0.03\text{mg}/\text{m}^3$ for an 8 hour period.

9. Safety phrases: S53 (Avoid exposure – Obtain special instructions before use). S26 (in case of contact with eyes, rinse immediately with plenty of water and seek medical advice). S36/37 (wear suitable protective clothing and glasses, wear suitable gloves) & S45 (In case of accident seek medical advice and show label where necessary)

10. What can be done to eliminate the risk altogether, or substantially reduce it?

Do not use acrylamide powder. The protocol can be altered to reduce exposure by purchasing it pre-made at a concentration of 30%. This has eliminated the necessity to weigh out and dissolve the chemical. At present, it is not known how to eliminate or reduce the chemical further except by non-use of the chemical.

11. Quantify the risks of injury, disease and other loss from these hazards. (Rating the severity of the risk against the likelihood of its occurrence).

Low ____ Medium High ____

Low: Where the probability of an accident occurring is low and the severity of the accident would be minor.

Medium: Where the probability of an accident occurring is possible and the severity of the accident would be serious.

High: Where the probability of an accident occurring is high and the severity of the accident is very serious.

12. Are risk control measures in place?

Yes, see existing controls.

13. State spill control procedure:

Spillage control granules are used to mop up a spill and the contaminated granules are placed in a container, sealed and sent for incineration.

14. Record your findings and use the records as part of the review process. Create an assessment file for your project and keep in a set location.

15. Monitor the measures i.e. review quarterly.

SIGNED: _____ **DATE:** _____

ASSESSOR

SIGNED: _____ **DATE:** _____

SUPERVISOR (where relevant)

SIGNED: _____ **DATE:** _____

Head of Department or Head of School

CRYOGENIC LIQUIDS	Ref: SWPS037	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Hazards

- Explosion
- Fire
- Cold Burns
- Asphyxiation
- Oxygen-Enriched Air

Person Exposed to Risk

Students Employees Public Contractors Visitors

Note

Due to the inherent danger, only fully trained personnel should handle cryogenic materials, fluid-piping systems, and related equipment. Supervisors must ensure that researchers/postgraduate students handling cryogenic materials obtain appropriate training.

Storage

The main issue to consider in the safe storage of cryogenic gases is ventilation. Due to the potential risk of asphyxiation, liquid nitrogen and solid carbon dioxide must not be stored in cold or growth rooms i.e. confined spaces.

-Liquid nitrogen:

Store only in a purpose-designed vessel. Dewar is the generic term used for such a vacuum insulated non-pressurized vessel. They vary in volume and the type used here for decanting are 25 litre containers, known as 'onions'. Culture storage vessels are often 50 litre volume. Liquid nitrogen is delivered weekly and decanted directly into the 'onions' and pressurized containers. Temporary storage can be in small Dewar vessels of 1 or 2 litre capacities. However, any lid must be vented to avoid the build-up of pressure, which would happen in a sealed vessel. Pressurized vessels are used where dispensing via a flexible hose is needed.

- Solid Carbon dioxide (Dry ice):

Pellets of solid CO₂ should be stored in insulated containers, do not store in an airtight container as the ice will sublime and possibly cause an explosion. Dry ice should not be stored in cold rooms or other confined spaces as it will replace the air in the room and could cause suffocation. Solid CO₂ can usually be disposed of by giving it to another laboratory that requires it e.g. organic chemistry.

Dry ice is heavier than air and precautions should be taken to ensure that there is no accumulation of CO₂ gas, leave the windows or a door open. DO NOT LEAVE DRY ICE UNATTENDED.

Transport:

Pressurized containers of liquid nitrogen must not be accompanied by anyone when being transported in the lift, due to the potential risk of sudden release of gas, if a bursting disc failed. The 25 litre unpressurized containers can be moved either with the decanting trolley (if the 'onion' is fitted with side lugs, or trunions) or with a set of small wheels. Unpressurized containers of liquid nitrogen should not be carried up, or down, stairs.

- The Safe Handling of cryogens:

Liquid Nitrogen

- Do not decant from liquid nitrogen storage vessels if you are not confident in handling liquid nitrogen. Seek help from trained personnel.
- Only decant into dedicated insulated liquid nitrogen containers (Dewar or vacuum flasks).
- Do not seal the lids.
- Do not use other types of container (such as polystyrene 'igloos' or plastic ice buckets).
- Liquid nitrogen is extremely cold and there is a risk of freezing your fingers should you handle ultra-cold items. Liquid nitrogen boils at -196°C and the liquid is even colder.

Solid Carbon Dioxide (Dry Ice)

- Always handle dry ice with care and wear protective gloves, glasses and a white coat, as it is extremely cold. Prolonged contact with the skin will freeze cells, as dry ice is extremely cold with a temperature of -78°C .

Personal protective equipment

A full-face visor is a minimum requirement when decanting liquid nitrogen as vigorous boiling and consequent splashing can be anticipated.

Gloves:

Non-absorbent, insulated gloves should be worn while handling liquid nitrogen. Avoid splashes, which could be trapped against the body and would make burns more severe, so avoid gauntlet style gloves.

Cryogloves must be worn if you will be handling ultra-cold items.

Further Information

Lab coat or overalls are advisable to minimize skin contact, also, wear trousers over safety shoe/boot tops to prevent shoes filling in the event of a spillage. Coat sleeves should have a tight cuff and can therefore seal over gloves and wrist.

TRANSPORTING HAZARDOUS MATERIALS WITHIN THE SCHOOL	Ref: <i>SWPS038</i>	Approved by: <i>FASC Feb 2011</i>
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Transporting hazardous chemicals or biological agents should be done only when absolutely necessary.

General**Further Information**

N.B. If transport of chemicals or biological agents is envisaged outside DKIT, there are strict rules governing the road/rail/airplane transport of hazardous goods.

CHEMICAL LABELS	Ref: <i>SWPS039</i>	Approved by: <i>FASC Feb 2011</i>
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Chemicals must be handled safely and all warning labels adhered to.

General

Learn the meaning of the following symbols as they indicate that a substance is a potential health hazard as outlined on the HSA website:

http://www.hsa.ie/eng/Archived_Material/FAQs/Chemical/CLP_Regulation.html

Further Information

S NUMBERS (SAFETY PHRASES)

- SHOW THE SAFEGUARDS NECESSARY FOR YOUR PROTECTION AND WHAT TO DO IN CASE OF ACCIDENT E.G. S39 WEAR EYE/FACE PROTECTION

R NUMBERS (RISK PHRASES)

- SHOW THE SPECIAL RISKS OF THE SUBSTANCE AND HOW IT GETS INTO THE BODY E.G. R45 MAY CAUSE CANCER

CHEMICAL SPILL	Ref: SWPS040	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

Chemical spills present hazards through contact to skin and eyes or through inhalation of vapours.

Person Exposed to Risk

- Students Public Contractors Visitors

Description



Chemical spills are any spill of chemical substances into a non-controlled environment. These spills may be relatively small in laboratory environments. Please insure the appropriate procedures are followed to prevent contamination of the environment, security of the area during clean up, and the safety of all individuals involved in the clean up process

General

10.1 Chemical Spill on a Person

1. Wash the affected area (skin, eye etc.) with water for 15 min. using the safety shower, eyewash or tap, depending on the location of the contaminated area.
2. Remove contaminated clothing; there are disposable overalls available, which can be used as spare clothing.
3. Call for help if required. First Aid personnel can be contacted using the names and phone numbers in the Preparation Lab, the Science Office and other locations in the corridors. Emergency contact numbers are also posted in these locations.
4. Complete an accident/incident report form and return it to the Head of School.

(This is available from the technical staff, Science Office or web site)

10.2 Surface Spills

1. Clean up a spill wearing chemically resistant gloves, coat, goggles, chemical respirator and, if necessary, call a member of the technical staff. Spillage absorption kits containing an SOP are available in each laboratory and will soak up spills quickly by simply pouring the media onto the spill, they will also help absorb some of the smell. The residue from the cleanup should be stored in a biohazard bag provided in each kit, which can be sealed. The container should be labeled with a waste label (see SWPS 030 Fig. 1) and given to the technical staff.
2. Complete an accident/incident report form and return it to the Head of Department.

Further Information

BIOHAZARDS	Ref: SWPS041	Approved by: FASC Feb 2011
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		Issued by EH: September 2017

Person Exposed to Risk

- Students
 Employees
 Public
 Contractors
 Visitors

Description

A biological agent is a microorganism, including those that have been genetically modified, a cell culture or a human endoparasite, which may be able to provoke an infection, allergy or toxicity.

Classifications

Group 1 Biological Agent

One which is unlikely to cause human disease. Group 1 biological agents rely on standard microbiological practices with no special primary or secondary barriers, other than a sink for hand washing.

Group 2 Biological Agent

One which can cause human disease and might be a hazard to employees. Group 2 biological agents rely on standard microbiological practices and access restricted to nominated workers only. Design of laboratories and containment level is according to Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 & amendment regulations, 1998.

Group 3 Biological Agent

Is one that can cause severe human disease and presents a serious hazard to employees and may present a risk of spreading to the community. Group 3 biological agents rely on standard microbiological practices and access restricted to nominated workers only. Design of laboratories and containment level is according to Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 & amendment regulations, 1998.

Group 4 Biological Agent

Is one which causes severe human disease and is a serious hazard to employees and which may present a high risk of spreading to the community and in respect of which there is usually no treatment available. Group 4 biological agents rely on standard microbiological practices and access is restricted to nominated workers only. Design of laboratories and containment level is according to Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 & amendment regulations, 1998.

Further Information

NOTE 1: The HSA (Health and Safety Authority) should be notified thirty days prior to the commencement of work involving the use for the first time of a group 2, 3 or 4 biological agents. The Institute Safety Monitoring Committee should also be informed before contacting the Health & Safety Authority (HSA). Risk assessments should be in place for each of the organisms you hold.

NOTE 2: A LICENCE should be obtained from the EPA (Environmental Protection Agency) prior to

commencing work with GMM's (genetically modified microorganisms) and GMO's (genetically modified organisms), and a report should be returned to the Environmental Protection Agency (EPA) once a year.

REDUCTION AND DISPOSAL OF BIOHAZARDOUS WASTE	Ref: SWPS042	Approved by: FASC Feb 2011
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		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

The School of Health and Science can be inspected at any time by the relevant authorities (Health and Safety Authority & Environmental Protection Agency) for compliance with hazardous waste regulations. Under the Waste Management Act, 1996, the generator of the waste is responsible for ensuring that the waste is disposed of correctly. Biohazardous waste for disposal will be risk assessed before being added to the system.

General***Minimization of Waste***

Minimize biohazardous waste by ensuring that only contaminated waste is put in a biohazard bag, sharps bin etc. Hazardous Waste Sharps Bins are collected by an approved contractor. Other biohazardous waste is autoclaved and disposed to general waste with appropriate attached label.

On completion of research projects or if you are leaving the School, undergraduate students, postgraduate students, postdocs., visiting researchers and staff must complete the relevant clearance form. This will help ensure that waste etc. is disposed of correctly before individuals leave the Institute.

Methods for the Reduction of Biological Waste (Teaching & Research)

1. Reduce the quantity of waste by ensuring that only contaminated flasks etc. are for sterilisation. No wrappings, tinfoil covers, parafilm, etc. should be bagged for sterilization, these uncontaminated items should be put in the normal waste stream.
2. Look at the amount of sterile plastics used, can they be reduced by changing the method slightly, e.g. instead of using 75ml sterile culture flasks will 25ml suffice. As well as the reduction in volume a reduction in the numbers of sterile flasks used is also an option.
3. Solid media (agars, etc.) reduction is also an option, can the numbers of petri-dishes be reduced?
4. Student help in the reduction of wastes in practicals should also be encouraged i.e. to instill awareness that the extra 10mls they have taken "just in case" can be eliminated. After all, if they run out of the solutions during an experiment, it is easy to get some more. Instill an awareness that wrappings, etc., as in 1-3 above, should not be bagged for sterilization; the reduction of culture flasks and other sterile plastics should be encouraged.

Categories of biohazardous waste

- **Solid waste** e.g. contaminated gloves, paper towel, cotton wool, disposable loops, tissue culture bottles, petri-dishes, flasks and disposable pipettes etc.
- **Liquid waste** e.g. tissue culture medium, microbiological media, microbiological cultures, broths,

media from fermentors etc.

- **Sharps** e.g. broken glass, needles, pipettes, scalpel blades, small glass vials, tips and ampoules, sharp pieces of metal.
- **Carcasses** etc. should be frozen to await disposal.
- **Mixed wastes** e.g. Biohazard waste containing solvents.

Labelling:

All biohazard waste containers must have a biohazard sign. Individual containers, bags etc. should be labelled with lab no. and operator.

Storage and Storage Containers

The generator of solid biohazardous waste should store the waste in a suitable container marked with a biohazard symbol. Biohazardous waste should be segregated from general waste for autoclaving and provided to the Microbiology Technical Officer.

Do not put sharp objects into an autoclave bag. Use a sharps container.

Autoclave Bag

If an autoclave bag is used, the bag should be double bagged. Liquid waste should not be put in these bags as leakage occurs. The autoclave bag should only be filled two thirds of the way and the neck tied loosely with autoclave tape, there should be a 5cm gap left at the top of the bag to ensure correct autoclaving. A laboratory nametag should be attached to the bag for identification. Sharp items should not be placed in an autoclave bag.

Sharps boxes (see SWPS 043)

Sharps containers should only be filled to the mark and the container sealed shut. Sharps containers do not need to be autoclaved. Please inform the Microbiology Technical Officer when waste is left for disposal.

Storage of Liquid Waste

Liquid waste should be put into Pyrex bottles, and only filled two thirds full. The bottles should be marked with autoclave tape. The lids should be loosened at least a ½ turn before autoclaving and resealed when removed from the autoclave.

Storage of Biohazardous Waste

In the laboratory solid biohazardous waste, petri-dishes, gloves etc. should be stored in a double autoclave bags suitably marked with a biohazard symbol and should be kept secure. Biohazardous waste should be segregated from general waste and should be removed regularly from laboratories. No build up of waste should occur. Large quantities should not be allowed to build up. Ensure that the cleaning staff do not remove this waste.

Storage of Carcass Waste

Carcass waste should be stored in a freezer to await disposal. It should be labeled with a date, laboratory name and amounts of chemicals added.. The waste contractor should be notified when this waste is being sent. A C1 form should be completed for this waste

Autoclaving

All biohazardous waste generated should be sterilized in an autoclave, which is capable of reaching 121⁰C at 15psi for 30 min., higher temperatures can be used if necessary. Spore strips should ideally be used to ensure complete sterilization. Chemical indicators are also used within a batch to be autoclaved.

Agar (waste) should be autoclaved with other general waste.

Once waste has been brought from your laboratory it should be autoclaved immediately.

When loading the autoclave it should be remembered that adequate space should be left between the items for sterilization. Do not overfill the autoclave. Refer to the Standard Operating Procedures for use of autoclaves in E210.

Sterilized liquid media from biological agents can be washed down the drain with plenty of water.

Training in the Safe Use of Autoclaves.

Only fully trained personnel are allowed to use the autoclaves, both large and medium sized. Training will be given by the Technical Staff in the use of this equipment. The operating procedures are detailed in SOPs (Standard Operating Procedures) in room E210.

Removal of Waste

A licensed (biohazard) waste disposal contractor will remove biohazardous sharps and frozen carcasses etc., a completed local authority C1 form should accompany the waste (a completed pink copy should be kept and filed in the Science Office).

N.B. Please inform the Microbiology Technical Officer if waste has been left for autoclaving or disposal.

Sharps	Ref: SWPS043	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
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Hazards

- Hepatitis, HIV and other blood borne diseases
- Cuts / stabs
- Needle Stick Injuries

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

This document is a general risk assessment for the use of sharps. This risk assessment should be reviewed fully by users of sharps prior to use of such equipment for the first time. A 'sharp' is any device having corners, edges, or projections capable of cutting or piercing the skin. The use of sharps in conjunction with chemical, biological or radioactive agents must be considered as part of any Hazardous Agent Or Process Specific Risk Assessment. When working with needles, glass and other sharp items there is a risk of sharps injury. If working with blood, human tissues, micro-organisms or chemical agents such injuries can lead to the risk of bodily infection or chemical exposure.

General**Glassware**

1. Use plastic as an alternative to glass when possible
2. Care must be taken when working with glassware. Particular care must be taken when:
 - Inserting pipettes into pipetting aids or Pasteur pipettes into teats
 - Attaching glass to or removing glass from rubber or plastic tubing
 - Removing "frozen" stoppers from glass bottles
 - Breaking glass tubing
 - Washing up glassware
 - Handling broken glassware
3. All broken, cracked or chipped glassware must be disposed off immediately
4. When handling glass items avoid applying force or excessive pressure in case the item slips or gives way suddenly and breaks. If inserting pipettes into pipetting aids or Pasteur pipettes into teats; attaching glass to rubber or plastic tubing; or removing "frozen" stoppers from glass bottles then the glassware should be held in a cloth to help prevent slipping.
5. Do not run when carrying glassware.
6. Carry glassware in suitable trays / cages where necessary.

Blades

1. Always handle blades with care.
2. Use the appropriate blade for the task. Do not use scalpel blades or razor blades unless absolutely necessary and when in use handle them with care.

3. Wherever possible use single unit disposable scalpels rather than changing the blades on a re-useable holder.
4. If not being disposed after use blades must always be placed in a safe position and orientation so as to avoid possible accidental injury to others. Do not leave scalpels pointing upwards from beakers or similar.
5. Where a blade is used in a holder, particular care must be taken when changing the blade. The blade should not be held in the fingers during the process and the use of excessive force must be avoided.

Needles

1. Needles should only be used if necessary, and always for the purpose that they were designed. Always consider less hazardous alternatives wherever possible.
2. There should be minimal handling of needles in the workplace. Once the seal on the sheath of a needle has been broken, carry out any subsequent handling with extreme care and keep handling to a minimum.
3. Used needles should be placed directly in a sharps bin at the point of use without either detaching the needle or re-sheathing – there should be no further unnecessary handling of a used unsheathed needle.
4. If needles require re-sheathing never hold the sheath with your fingers as if the needle misses the sheath it will puncture a finger.
5. Do not detach the needle from the syringe unless absolutely necessary.
6. Unsheathed and used needles must not be left on worktops or mixed with other items. They should be placed into a tray or similar container where they are clearly visible.
7. Any needle stick injury caused by an implement contaminated with human, microbial, animal, chemical or radioactive material should be immediately reported and the victim must seek immediate medical advice.

Disposal

1. Place used needles and syringes, or any other types of sharps, directly into a sharps bin for disposal.
2. Have a sharps bin available at the point of use to enable immediate disposal.
3. Dispose of used sharps only in an appropriate bin. Clearly label sharps bins as to their allowable content.
4. Do not overfill sharps bins; fill only as far as the fill line.
5. Never place sharps or sharps bins in plastic bags or a domestic refuse bin for disposal.
6. Sharps contaminated with infectious or chemical material may require specialist storage and disposal.

First Aid

1. Cuts caused by sharps should be treated immediately. No attempt should be made to remove broken glass from wounds. Needle stick injuries from contaminated needles should be encouraged to bleed. Wash well under running water and cover with a dry dressing. An attempt should be made

to identify any chemical or biological hazard in the needle that may have been injected.

2. Apart from very minor injuries, a First Aider should be called.
3. In the event of sustaining an accident resulting in a wound:
 - Immediately wash the wound liberally with soap and water but without scrubbing
 - Do not attempt to remove any glass by hand
 - Gently encourage free bleeding of puncture wounds but do not suck the wound
 - Dry the area and apply a waterproof dressing
 - Seek medical advice if the sharp concerned was contaminated with any hazardous materials
 - There is no evidence available to show that using antiseptics or squeezing a wound will reduce the risk of transmission of a blood borne pathogen. Using a caustic agent such as bleach to wash a wound is not recommended.

Further Information

[http://www.hsa.ie/eng/Your Industry/Healthcare Sector/Biological Agents /Sharps](http://www.hsa.ie/eng/Your_Industry/Healthcare_Sector/Biological_Agents_/Sharps)

BIOHAZARD SPILL	Ref: SWPS044	Approved by: FASC Feb 2011
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Hazards

- Infectious or fatal diseases
- Slips, trips, falls
- Lacerations

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

The proper response to a spill is important to maintaining a safe work environment. Inside a hospital or lab environment, the correct response becomes even more important.

General

- Immediately notify other individuals in the area that there has been a spill.
- If there is a hazard associated with aerosol released from a spill, everyone should be advised to leave the area (applicable to class 2, class 3 and class 4 organisms).
- If necessary, cordon off the area and post appropriate warning signs
- Individuals involved in the spill should check for contaminated clothing, footwear and skin before attempting to clean up.
- Contaminated skin should be washed immediately with soap and water and medical advice sought.

Basic Clean Up Procedure

The spill should be cleaned up wearing a white coat, safety glasses and suitable gloves. If necessary, ensure that the area is evacuated. Identify the area of the spill allowing sufficient area around the spill for splashing or drying, which may have occurred.

The following procedure is located in each spill kit in each laboratory.

1. Cover spilled material with enough Universal sorbent (yellow material) to contain all liquid.
2. Start from the outer edge of the spill and work towards centre.
3. Use a brush and dust pan to sweep up saturated universal sorbent: avoid creating dust.
4. Place material in zip lock bag and seal the bag.

5. Label the contents of the bag and notify technical staff immediately.
6. Ensure your hands are washed thoroughly with soap and water.
7. Complete an accident/incident report form and submit to the Head of Department

Further Information

Environmental Protection Agency (<http://www.epa.ie>)

Occupational Safety and Health Administration (<http://www.osha.gov>)

IMMUNISATIONS	Ref: SWPS045	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Work Description

Persons who come into contact with blood or human tissue

Controls**1. Vaccination and Immunisation**

Immunisation of laboratory staff may be required in some situations as is serological monitoring. Immunisation is required where it is known that staff will come in contact with blood or human tissue on a regular basis. The vaccine given is either Hep A or Hep B or a combined vaccine. Tetanus vaccine can also be obtained.

2. Obtaining a Vaccine

Students from Nursing, Midwifery and Health studies programmes require vaccination for Hepatitis B. Vaccination is provided by the HSE for Nursing/ Midwifery students on commencement of the programme and is compulsory. Health and Physical Activity (voluntary) and Early Childhood studies students also receive vaccination in stage 1 of the programme. If a student from Health and Physical Activity refuses vaccination they must sign a waiver form.

The Institute doctor will administer the vaccine or will arrange serological monitoring as appropriate. The Head of Department will contact HR, if the laboratory worker is a member of staff, postgraduate student etc. and an appointment will be arranged. Postgraduate students will also use the Institute doctor but their supervisor should also be informed.

Further Information

Please read Biohazards (SWPS041)

EMERGENCY REPSONSE	Ref: SWPS046	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Work Description

Emergency protocol for everyday working environment.

Emergency Contacts

1. Dial 9 for an outside line, then 999 or 112 and you will be connected directly to the emergency services.
2. Be prepared to give the following information:
 - a. Information on the condition of the victim, if there is a casualty.
 - b. Details of any hazards, i.e. fire/chemical/gas/radiation/biohazard etc.
 - c. Exact location of the accident (room number and building).
3. Call the Estates Office (2671/2670) and give the above details.
4. If deemed necessary, contact the Nurse (2777) and trained Department first aiders.
5. Call Reception (500), ask them to alert the caretaker on duty and give them the above details also.
6. Report to the Head of Department, Head of School, and your Supervisor (where relevant).
7. As soon as practically possible, report the accident on an accident/incident report form and submit to the Head of Department.
8. Emergency contact numbers are strategically located throughout the School of Health and Science in areas such as;

Dept. of Applied Science: the Preparation Room, all Labs, Science Office and various other locations in the corridor. They are also listed in a file on the Department of Applied Sciences shared drive (S)

Dept. of Nursing, Midwifery & Health Studies: Staff Canteen, Admin Office, Notice Board (1st + 2nd Floor), CSL reception area.

Smooth Muscle Research Centre (SMRC): H+S Point, main corridor

Netwell Research Centre (NRC): H+S Point, office corridor and staff canteen

First Aiders

A list of trained first aid staff and current telephone numbers are available from Admin Office (Department of Nursing, Midwifery & Health Studies) and Admin. Science Office (Department of Applied Sciences) and are also on display throughout the School of Health & Science in locations listed below;

Dept. of Nursing, Midwifery & Health Studies:

Ground Floor: beside lift and inside coffee dock,

First floor: on notice board beside CSL main entrance and in CSL's hallway

Second floor: lists are available at the: Tea Station, Admin Office and Photocopying room.

Dept. of Applied Science:

Science Office

All Laboratories

Smooth Muscle Research Centre:

Ground Floor: H+S Point, main corridor and selected Labs

Netwell Research Centre:

Ground Floor: H+S Point, office corridor

First Floor: Staff Canteen

First Aid Box Locations:

- Dept. of NMHS; Ground Floor and in coffee dock
- Dept. of NMHS; First Floor; Clinical skills laboratory and Exercise Lab
- Dept. of NMHS; Second floor, First Aid box is located in the Staff Tea Station
- Dept. of Applied Science; Ground Floor, Goods Inwards and Science Food Laboratory,
- Dept. of Applied Science; Available in majority of laboratories as are sterile bottles of saline for eye irrigation and safety showers
- SMRC; H+S Point, main corridor and selected Labs
- NRC; H+S Point, office corridor and staff canteen

Fire Fighting Equipment

Fire extinguishers and/or fire blankets are strategically located throughout the School of Health and Science. The majority of fire-fighting equipment points are located in Science laboratories and on each floor in the Dept. of Nursing, Midwifery & Health Studies building. There are a number of trained fire wardens in the School. Fire warden courses are run on a regular basis and are available through the Estates Office. The School abides by the Institute Policy and Procedures on fire safety.

Further Information

All training in First Aid, Emergency Response, and Fire Safety/Wardens is available through consultation with your Head of Dept and Health and Safety Co-ordinator. The School abides by the Institute Policy on first aid safety.

EMERGENCY CONTACT NUMBERS	Ref: SWPS047	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Important contact details which are available throughout all Departments in case of emergency

General

Ambulance/Fire Brigade: **112 or 999**

Health Centre/Campus Nurse: **2777/ 087-7721914**

Doctor: **Dr. Shane Gleeson: 2702/ 042 9320038**

Hospital: **Louth Hospital: (042) 933 4701**

Poison Information Service: **Beaumont: (01) 8092566**

Head Caretaker: **Henry Mc Loughlin (0872802521)**

Taxis: **Sevens (042) 9377777**

SAFETY SHOWERS and FOUNTAINS	Ref: SWPS048	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Safety showers and fountains are present in all areas where chemicals are being used and/or where clothing fires could occur.

General**18.1 Safety Showers**

Single head emergency showers should be located close to all areas where chemicals are being used or where clothing fires could occur. To ensure adequate operation of the units, all individuals working in laboratories should be instructed in the proper use of the shower. If an individual becomes contaminated with chemicals etc. the affected area should be rinsed immediately for at least 15 min. and a doctor or nurse should be contacted.

Emergency shower units are not a substitute for the use of appropriate primary personal protective equipment. To protect against flying solid particles and splashing hazardous liquids, staff and students should wear eye and/or face protectors, protective clothing and appropriate gloves. Fume hoods should be used as primary protection as they can contain fumes, splashing and a spillage.

18.1.1 Testing

Safety showers should be tested once a month by technical staff. To test, the shower should be run for at least 10 min to ensure that there are no blockages in the mains and to check that the water is clean. A minimum of 30L of water per minute should be the flow rate. If there is a fault in the shower it should be reported to the Head of Department using an Accident/Dangerous Incident Report Form , and raise a Maintenance Request form ASAP.

18.2 Eye/Eye-Face Wash Fountains

Eye/eye-face wash fountains should not be used if it is known that the eye contamination is metal or some other rigid solid fragment. In such an event both the victim's eyes should be gently immobilized by a trained first aider or the college nurse in accordance with the current standard First Aid Manual (2)

and medical attention immediately sought.

Emergency eye/eye-face wash units are not a substitute for proper primary personal protective equipment. To protect against flying solid particles and splashing hazardous liquids, all individuals working in lab areas should wear eye and/or face protectors.

Emergency eye/eye-face wash units should be in all areas where chemicals are being used. To ensure adequate operation of the units, all individuals working in lab areas should be instructed in the proper use of the eye/eye-face wash fountain. If an individual becomes contaminated with chemicals etc. the affected area should be rinsed immediately for at least 15 min. and a doctor or nurse should be contacted immediately.

18.2.1 Testing

Eye/eye-face wash fountains should be tested once a week by technical staff. To test, the eye-wash should be run for at least 10 min. to ensure there are no blockages in the mains and to check that the water is clean. A jet of water from each nozzle should meet in the middle. If there is a fault in the eyewashes it should be reported to the Head of Department using an Accident/Dangerous Incident Report Form and raise a Maintenance Request form ASAP.

18.3 Location of Emergency Showers.

Safety showers and eye washes are fitted in most laboratories in the Department of Applied Sciences: NC130, NC131, NC132, NE201, , NE207, NE220, NE226, NE210, and NE237, NW110

Further Information

1. It is vital that Emergency Safety Showers and Eye/Face-wash Fountains be visually inspected every day to make certain that nothing has been placed around in or around them which may prevent quick and easy access
2. In "*The Definitive Guide to Emergency Safety Showers, Eyebaths and Facewash Fountains*".Ed: Hughes, U.K.

FASC SAFETY REPRESENTATIVES	Ref: SWPS049	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Sections 25 and 26 of the Safety, Health and Welfare at Work Act 2005 (2005 Act)

Role

- Inspect the whole or part of a workplace that they represent at a frequency agreed between them and Head of School/Dept.
- Be present when the inspector interviews staff
- Make verbal or written representations to Head of School/Dept. on safety, health and welfare at the place of work
- Be present during Health and Safety inspections
- Receive advice and information from inspectors in relation to safety, health and welfare at the place of work
- Consult and liaise with other safety representatives across the different Departments and Research Centres
- Investigate accidents and dangerous occurrences
- Receive time off from their work, without loss of remuneration, to acquire the knowledge and training necessary to perform their function effectively
- Consider and expeditiously dispose of health and safety complaints;
- Ensure that adequate records of work accidents, health hazards and the disposition of health and safety complaints are kept, and regularly monitor this data;
- Meet with Head of School or Dept. as necessary to address health and safety issues
- Make yourself available regularly to attend School FASC meetings. If unable to attend please send apologies by email prior to meeting.
- Participate in all inquiries, investigations, studies, and inspections pertaining to the health and

safety of staff and students

- Cooperate with health and safety officers and inspectors;
- Participate in the implementation of planning for changes that may affect occupational health and safety, including work processes and procedures
- Participate in the development of health and safety policies and programs
- Be trained First Aider and/or Fire Warden
- Full list of FASC Members available in School Ancilliary Safety Statement

Further Information

http://www.hsa.ie/eng/Publications_and_Forms/Publications/Safety_and_Health_Management/Safety_Representatives_Resource_Book.html

Safety Inspection Reports	Ref: SWPS050	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Important Health and Safety document used to audit safety standards through-out the different Department areas

General

Please review Ancillary Safety Statement (Appendix III)

1. Health and Safety Building Inspection Checklist
2. Health and Safety Laboratory Inspection Checklist

Health + Safety Inspection Checklist

School/Department: _____ Date: _____
 Inspected By : _____ Reviewed By : _____

Comments:

<u>1</u>	General Safety + Housekeeping		
1	Passageways and aisles kept clear?		
2	Floors clean, dry + spill free?		
3	Warning signs and/or mats used where floors are wet		
4	Carpeted areas free of S/T/F hazards (frayed, loose, rips, bumps)		
5	Waste bins provided + emptied regularly		
6	Is lighting sufficient?		
7	Is ventilation adequate?		

<u>2</u>	Fire + Electrical Hazards Prevention and Safety		
1	All fire alarms functioning properly + tested annually		
2	Planned + unplanned fire drills conducted at regular intervals		
3	Electrical outlets adequate (no overloads or unapproved extension cords)		
4	Plugtops, Sockets and Leads free from damage or deterioration		
5	Electrical panels labelled properly + free of defects		
6	Surrounding areas free of flammable, hazardous, combustible materials		
7	Electrical closets free of storage		

<u>3</u>	Egress		
1	Corridors + Walkways clear of obstacles + clutter		
2	Corridors + Walkways well lit at all times		
3	Exit doors clearly marked + unobstructed		
4	Emergency + Exit lights readily visible and in working order		
5	Stairways + Handrails well lit and in good condition		

<u>4</u>	Emergency Equipment + First Aid		
1	Emergency equipment accessible and in good condition		
2	Fire extinguishers appropriately located, mounted and accessible		
3	Fire extinguishers are charged and have safety pins and seals intact		
4	Service Date available		
5	First Aid boxes available		
6	First Aid box appropriately stocked		
7	Emergency numbers posted and available		

<u>5</u>	Maintenance (Exterior + Interior)		
1	All doors + locks in good working order		
2	Ceiling tiles intact, undamaged and in place		
3	No signs of weather damage or mold growth		
4	All windows unbroken + free from any type of damage		
5	A.C. vents + ducts clean upon visual inspection		
6	Light fittings + switches clean and in good working order		
7	Elevator functioning properly + inspection certificate up-to-date		
6	Exterior of the building presents no safety concern		

<u>6</u>	Facilities + Hygiene		
1	Staff kitchen and eating areas clean + sanitary		
2	Restrooms facilities clean + sanitary		
3	Restroom facilities adequately stocked with necessary supplies		
4	Drinking fountains clean + in good working order		
5	Hand Soap + Paper towels available in		
6	Food and Drink consumed in designated areas only		
7	No Smoking		

Laboratory Health + Safety Inspection Checklist

School/Department: _____ Room: _____
 Inspected By : _____ Date : _____
 Reviewed By: _____

Comments:

<u>1</u>	General		
1	Are passageways and aisles kept clear?		
2	Are floors dry + spill free?		
3	Are benches clean and wiped down?		
4	Are all cables and leads stored neatly and not causing S/T/F hazard?		
5	Is the area in general kept clean and tidy?		
6	Is lighting sufficient?		
7	Is ventilation adequate?		

<u>2</u>	Hazardous + Chemicals Materials		
1	Safely Secured		
2	Safely and compatibly stored		
3	Labelled		
4	Protective caps/lids fastened		
5	Waste and sharps containers available		
6	Spill kits available		
7	Collection and Disposal		

<u>3</u>	Machinery + Electrical Appliances		
1	Plugtops, Sockets and Leads in good condition		
2	Emergency stop buttons where required		
3	Regularly serviced		
4	Clean and unobstructed		
5	All guards fully operational		
6	Fume hood not used as permanent storage/ no clutter in fume hood		

<u>4</u>	Emergency Equipment & Egress		
1	Exits + Aisles clear of obstruction		
2	Exit signs in place		
3	Emergency lighting in place		
4	Showers and Eye/Face Wash Fountains identified and operational		
5	Showers and Eye/Face Wash Fountains accessible and unobstructed		
6	Showers and Eye/Face Wash Fountains in good condition and tested		
7	Emergency numbers posted and available		

<u>5</u>	Fire Equipment/First Aid		
1	Fire extinguishers appropriately located and accessible		
2	Fire extinguishers are charged and have safety pins and seals		
3	Service Date available		
4	First Aid box available		
5	First Aid box appropriately stocked		

<u>6</u>	Hygiene		
1	Hand Soap available		
2	Paper Towels available		
3	No Food and Drink		
4	No Smoking		
5	Clean PPE being used		

Further Information

- School Ancillary Safety Statement
- [Http://www.dkit.ie/aboutdkit/healthsafety](http://www.dkit.ie/aboutdkit/healthsafety)

UNDERGRADUATE CLEARANCE FORM	Ref: SWPS051	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

General

This form can be obtained from the Science Office or Web Site and should be completed by the student and signed by the relevant supervisor and a technical officer. The laboratory and facilities used by the project student should be left clean, tidy and safe.

UNDERGRADUATE/POSTGRADUATE CHECKLIST	Yes	No
LABORATORY		
Is the bench space clean, cleared and left in a safe manner?		
Have the underbench units been cleaned and left in a safe manner?		
Have the drawers been cleared and cleaned and left in a safe manner?		
Donate any remaining chemicals and MSDS to your colleagues		
Have you removed and disposed of your chemical and biohazardous waste in the correct manner?		
Have you samples remaining? Donate them to your colleagues or safely dispose of them		
Have you cleared data stored on instruments/computers etc.?		
Have you cleaned and returned equipment borrowed from the prep room, other labs, etc.?		
Have you returned glassware to the prep room?		
Have you returned keys for the labs, building, lockers etc.?		
Have you cleaned the equipment used in these laboratories?		
Ancillary laboratories and rooms		
Have you tidied and cleaned the cold rooms and left them in a safe manner?		
Have you tidied and cleaned the instrument room, laboratory or ancillary area where you worked and left it in a safe manner?		
Have you tidied and cleaned laboratories and ancillary areas where you worked and left them in a safe manner?		
Have you cleaned equipment used in these areas?		
Have you removed and disposed of your chemical and biohazardous waste?		

Who has taken responsibility for your remaining chemicals and samples?

Name: _____ Room no: _____

Laboratory room number/s used: _____

Student Name: _____ Signature: _____

Supervisor: _____ Signature: _____

Technical Officer: _____ Signature: _____

N.B. Signatures signify that all procedures required have been fully complied with and were verified by the supervisor.

Further information

A copy of this form should be left in the Science Office.

POSTGRADUATE CLEARANCE FORM	Ref: SWPS052	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

General

This form can be obtained from the Science Office or Web Site and should be completed by the student and signed by the relevant supervisor and a technical officer. The laboratory and facilities used by the project student should be left clean, tidy and safe.

POSTGRADUATE CHECKLIST	Yes	No
LABORATORY		
Is the bench space clean, cleared and left in a safe manner?		
Have the underbench units been cleaned and left in a safe manner?		
Have the drawers been cleared and cleaned and left in a safe manner?		
Donate any remaining chemicals and MSDS to your colleagues		
Have you removed and disposed of your chemical and biohazardous waste in the correct manner?		
Have you samples remaining? Donate them to your colleagues or safely dispose of them		
Have you cleared data stored on instruments/computers etc.?		
Have you cleaned and returned equipment borrowed from the prep room, other labs, etc.?		
Have you returned glassware to the prep room?		
Have you returned keys for the labs, building, lockers etc.?		
Have you cleaned the equipment used in these laboratories?		
Ancillary laboratories and rooms		
Have you tidied and cleaned the cold rooms and left them in a safe manner?		
Have you tidied and cleaned the instrument room, laboratory or ancillary area where you worked and left it in a safe manner?		
Have you tidied and cleaned laboratories and ancillary areas where you worked and left them in a safe manner?		
Have you cleaned equipment used in these areas?		
Have you removed and disposed of your chemical and biohazardous waste?		

Who has taken responsibility for your remaining chemicals and samples?

Name: _____ Room no: _____

Laboratory room number/s used: _____

Student Name: _____ Signature: _____

Supervisor: _____ Signature: _____

Technical Officer: _____ Signature: _____

N.B. Signatures signify that all procedures required have been fully complied with and were verified by the supervisor.

Further Information

A copy of this form should be left in the Science Office

LABORATORY SAFETY REGULATIONS	Ref: SWPS053	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

All persons working in a laboratory must adhere to these regulations.

Students must follow the instructions of their lecturer during laboratory periods. The lecturer/demonstrator will ask them to leave the laboratory if they are behaving in a manner that compromises the safety of themselves or their fellow students.

General

1. Students must not enter the laboratory without supervision.
2. Students must arrive on time for laboratory classes. These classes generally begin with an explanatory lecture and practical demonstration or skills training. If a student is late, the lecturer/demonstrator will not allow you to join the class if there are safety implications.
3. Mobile phones should be switched off while in the laboratory.
4. Smoking, eating, drinking, chewing gum and applying cosmetics are prohibited in all laboratories.
5. Students who are suspected to be under the influence of a toxicant (i.e. alcohol or drugs) will be asked to leave the laboratory.
6. Students and staff must obey the practical procedures and pay attention to the warnings about dangerous chemicals and biohazards, taking care to follow any safe work procedures that have been outlined.
7. Entrances and exits must be kept free. Bags, coats etc. must be stored in lockers or under benches.
8. Working areas, fumehoods and equipment must be kept clean and tidy and free of clutter
9. Never work alone in the laboratory.

Personal Protection

10. Howie-style laboratory coats must be worn at all times and buttoned up properly (with the exception of the Physics laboratory).
11. Safety glasses must be worn in all labs (with the exception of the Physics and Food Technology laboratories). Contact lenses should not be worn in laboratory areas. Wear safety glasses over prescription glasses or use prescription safety glasses. Students may be allowed to remove their safety glasses in some laboratories (e.g. Biology, Microbiology) – this will be at the discretion of the lecturer/demonstrator.

12. Sandals or open toed footwear must not be worn in the laboratory.
13. Long hair should be tied back and any dangling accessories and jewellery removed. Avoid over-use of hair spray and other hair products.
14. Protective gloves should be worn where necessary.

Accidents and Emergencies

15. All personnel must know the locations of the emergency exits, assembly points, first aid boxes, fire extinguishers, fire blankets, safety showers and emergency contacts.
16. All personnel must evacuate the building once the fire alarm has sounded. Comply with fire warden instructions.
17. All accidents must be reported to the lecturer/demonstrator or technician.
18. All equipment breakages must be reported to the lecturer/demonstrator or technician.

Hygiene

19. All personnel must always wash their hands after using any substances hazardous to health, on leaving the laboratory, and before and after visiting the toilet
20. No pipetting by mouth. Appropriate pipette pumps or automatic pipettes should be used.
21. Do not touch surfaces with your contaminated gloves if those surfaces may be touched by others (phones, door handles, etc.)

Storage and Disposal

22. Solvents should be disposed of in the relevant labelled disposal waste bottles provided. Do not mix chlorinated and non-chlorinated solvents.
23. Broken glass or sharp objects should be placed in the sharps bin.
24. Always return stock bottles/jars/dewar's etc of highly flammable liquids or acids to their correct store cupboard or shelf after work had finished.

Safe Handling of Microbial Cultures

1. The general safety precautions apply.
2. Appropriate immunisations should be obtained when handling mammalian tissue, blood, cells etc.
3. All cultures (cell and microbial) should be treated as potential pathogens.
4. All personnel should familiarize themselves with the hazardous properties of the organism they are using.
5. Aseptic technique must be employed.
6. Spills should be cleaned up, using a microbial disinfectant e.g. 70% alcohol and placed in a biohazard bag.
7. To avoid a fire; alcohol solutions must be covered when using a Bunsen. Extreme care should be used when near a Bunsen where a cotton bung is being used in a flask.

8. Care should be taken when opening freeze-dried ampoules; use protective gloves and swab with 70% alcohol.
9. Broken ampoules should be disposed of in a sharps bin.
10. The formation of aerosols should be avoided e.g. do not pour cultures, do not drop pipettes into disinfectant and flame loops carefully. When using a centrifuge to pellet cells allow 10 min after centrifugation to allow an aerosol to settle.
11. When skin contact of microorganisms, tissue, body fluids, etc. is unavoidable gloves should be worn.
12. Material that is contaminated with microorganisms, tissue, etc. Must be placed in an autoclave bag for sterilization.
13. Cultures must be sterilized by autoclaving before disposal.

Further Information

Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ASK YOUR SUPERVISOR BEFORE PROCEEDING WITH THE ACTIVITY.

Animal Handling	Ref: SWPS054	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

- Bites
- Scrapes
- Crush or impact injuries
- Back/ neck/ shoulder injuries
- Exposure to Zoonoses (Parasitic: Toxoplasmosis, Toxocariasis, Ancylostomiasis, Dipylidiasis, Cryptosporidiosis, Giardiasis, Dermatophytosis, Cheyletiellosis, Sarcoptes, fleas/ ticks. Non- Parasitic: Leptospirosis, Chlamydiosis, Salmonellosis, Bartonellosis, Borreliosis)

Person Exposed to Risk

Students Employees Public Contractors Visitors

General

- Teaching staff are responsible for assessing each situation where students are in contact with animals and must provide the necessary guidance on a case by case basis.
- There is an inherent risk when handling all types of animals which can never be fully eliminated, nevertheless all personnel must ensure they take every reasonable precaution in order to minimise the likelihood of accidents occurring. Staff and students who regularly handle animals should consult their GP regarding vaccinations, e.g. Tetanus.

Control Measures

- Where possible, obtain information on an animal's temperament from it's' owners / carers before handling.
- Avoid sudden movements and loud noises when handling animals.
- Never put your face directly into the face of an animal.
- Approach animals in a calm and confident manner. Do not move in behind or crowd around an animal. Never allow yourself to be cornered when examining an animal. Always maintain a clear route to move away quickly.
- Concentrate on the animal you are handling without being distracted by other activities.
- Never sit on the floor while handling/examining an animal. If the animal becomes aggressive or aroused you will be unable to move away or protect yourself and risk serious facial bites.
- Remember that animals in pain or suffering from an illness may be more aggressive than normal.
- Always be prepared to protect yourself or move away quickly in the event an animal becomes aggressive unexpectedly.

- If there is any doubt about the temperament of an animal-ASK FOR ASSISTANCE.
- Staff and students involved in handling animals must receive manual handling training.
- Good hygiene practice is essential after handling animals.
- All cuts should be covered.
- Where necessary latex examination gloves should be worn.
- Pregnant women should not handle animals until a *Pregnant Employee Risk Assessment* has been carried out.
- Animals exhibiting potentially aggressive behaviour should have a kennel or cage sign (CAUTION) posted to alert others who may be handling the animal. Specific alerts or recommendations should be written on the sign. Dogs which display territorial aggression (*kennel guarding* behaviour) should have their record/sign so marked and extreme care should be used when removing from the kennel.

Restraint and Control

It is the responsibility of lecturing staff to decide on the type of restraint required and what level of interaction students will have with a particular animal.

Types of restraint to be used include;

- Verbal
- Physical – Hand, leash, muzzle, pole, towels

There are no hard and fast rules as to what method works best in which situation.

Factors that may influence your decision on which method to use are:

- Your personal safety
- The safety of the animal
- The safety of others in the vicinity
- The amount of time that you can spend in the process.

In general, you should start by using the least amount of restraint possible while maintaining effective control over the animal. The situation may call for you to gradually escalate the degree of restraint.

Every dog being transported or handled in the clinic/classroom must always wear a slip-lead. Cats must always be transported in a suitable carrier.

Small Animals

1. Always hold small animals securely using the most appropriate techniques for that type of animal e.g. lifting an individual by the tail may be suitable for one species but not for another.
2. Be aware that many small animals tend to bite and scratch.
3. If holding small animals tightly protective clothing should be worn to prevent danger, urine or faeces coming into contact with the handler's skin.

Large Animals

1. Always approach a large animal within its field of vision if possible, i.e. do not 'sneak' up on it. Always 'announce' your approach.
2. In so far as is practicable, hold large animals in restraining devices when administering treatment.
3. Be aware that cattle if in pain tend to kick to the side on which the pain is felt. It may be safer to approach from the other side.
4. Safety shoes or boots may be required when working with large animals if there is a risk that they can trod on a handler's feet.
5. Where possible isolate large animals from handlers through the use of chutes and crushes.
6. Be wary of large animals in season who may be excited by other animals in the hospital area.
7. Ensure good housekeeping in areas where large animals are held to prevent slipping of animals or their handlers.
8. The movement of unconscious large animals should always be done using a hoist or similar.
9. In the event that a large animal gets loose and is out of control the immediate area must be evacuated, the perimeter secured and the relevant person in charge informed

Further Information

While the students are working in the Louth County Council Animal Pound in Dromiskin, advice of local dog wardens should be sought regarding the dogs selected for use.

Electrical Safety + PAT	Ref: SWPS 055	Approved by: FASC Feb 2011
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		Issued by EH: September 2017

Hazards

- Shock & Burns
- Arcs & Arc Blasts
- Fires/Falls/Foul-ups
- Explosions/electrocutions

Person Exposed to Risk

Students Employees Public Contractors Visitors

In the event of an accident involving electricity the immediate risk is to the person exposed to the electrical charge. In the event that this person is touched before being isolated from the power source the risk spreads to the person touching the initial victim. Electrical faults which initiate fire pose a risk to all persons in the immediate area. Trip hazards formed by electrical wiring pose a risk to all persons working in the immediate area.

Description

The main hazard from electricity is electric shock, which can lead to electrical burns, shock, asphyxia and death. Electricity is also a major cause of fire. Electrical wiring can also present a trip hazard. The use of incorrectly rated or poorly maintained electrical equipment in areas where flammables are present may also represent a fire hazard.

Controls**General**

- Before electrical equipment is worked on, the switching, isolation, disconnection procedures and other precautions must be identified.
- Any person who is NOT electrically qualified must maintain a minimum distance of 10ft from any exposed live part.
- Visual inspections of all electrical tools and equipment for wear, breakages, or damage is

required before use.

- All portable electrical equipment will be handled in such a manner that will not damage or reduce service life
- Installation or repair work may only be carried out by skilled and competent persons
- All electrical equipment, unless proven to be de-energized, must be treated as live.
- All electrical equipment will be de-energized + verified before beginning service or repairs
- If work must be performed while equipment is energized or if de-energizing is not feasible, additional safety measures will be taken to ensure the safety of the qualified employee and any other persons who may be exposed. (see SWPS005)
- New installations will comply with the requirements of the above mentioned legislation (see Appendix1)
- The Estates Office must be informed and approve of any electrical installation work in the School.
- Flexible cables will be adequately protected against external mechanical and heat damage.
- Flexible cables should not be run across floors or walkways. Where electrical cables have to be run across open floor areas ramps will be placed over them to prevent the tripping and damage to cables.
- Adequate fusing or excess protection, e.g. circuit breakers, must be provided for all fixed and portable equipment.
- RCDs should be tested in accordance with current standards
- The hazardous locations to be aware of include; wet or damp areas, combustible or flammable atmospheres, restricted access or egress, and low lighting zones.
- Portable generators shall be so placed to ensure exhaust fumes do not enter nearby buildings and shall not be used indoors. They should be separated from the public by a physical barricade and not placed within at least 20 feet of fuel containers.
- Adequate lighting is essential at all times
- All portable ladders used for electrical works should be non-conductive and of adequate length and size to complete the task safely
- Barricades, safety signs, safety symbols, or accident prevention tags will be used where necessary to warn and protect employees from contact with electrical hazards.

PPE

- Electrical personnel should not wear clothing made from combustible synthetic materials such as acetate, nylon, polyester, etc.
- Persons working in areas where there are potential electrical hazards will be provided with and use protective equipment that is appropriate for the work to be performed (i.e. fire-resistant, non-conductive, of correct fit, and in good condition)

Reporting

- All electrical accidents, incidents, or near-misses must be immediately reported to Department Supervisors and to any other organisations as required by statutory regulation.

Housekeeping

- Keep substations and Motor Control Centre (MCC) rooms free of debris

- Do not store flammable materials and unnecessary equipment in substation and MCCs
- Areas around fuse boards will be kept clear of flammable materials and the fuse board cabinets will be kept closed at all times when not in use.

Portable appliance testing (PAT)

- The purpose of Portable Appliance Testing is to ensure that portable and transportable electrical equipment is maintained in a safe condition so as to avoid any hazard to person's or property
- Portable electrical items such as microscopes, oscilloscopes, kettles, toasters, coffee makers will be tested by a competent person annually and the results held for 5 years. The competent person will carry out the following;
 - Physical examination,
 - Earth bond test,
 - Insulation test.
- The above equipment and others such as PCs, desk lamps, fans, extension leads, sockets etc will be visually checked annually by a designated member for each department (see Appendix 2)
- The following should be checked for after disconnecting the appliance from the mains:
 - a) there is inadequate length of cable for the way the appliance is used
 - b) there is damage (apart from light scuffing) to the cable sheath, or it is kinked or knotted.
 - c) the plug is damaged, for example the casing is cracking or the pins are bent;
 - d) there are inadequate joints including taped joints in the cable;
 - e) the outer sheath of the cable is not effectively secured where it enters the plug or the equipment. Obvious evidence would be if the coloured insulation of the internal cable cores were showing;
 - f) the rubber on plastic bush where a cable passes into a metal panel is missing or damaged;
 - g) the equipment has been subjected to conditions for which it is not suitable, e.g. it is wet or excessively contaminated;
 - h) there is damage to the external casing of the equipment or there are some loose parts or screws;
 - i) there is evidence of overheating (burn marks or discoloration)

Defective Equipment

- Equipment found to be defective must immediately be withdrawn from service and labelled “DANGER - DO NOT USE” and its associated plug removed if it is to be repaired, or otherwise directly made inoperable and safely disposed of, or destroyed.

Further Information

- Safety, Health and Welfare at Work (General Application) Regulations 2007 – Part 3
<http://www.hsa.ie/eng/Legislation/Acts/Safety Health and Welfare at Work/General Application Regulations 2007/>
- Electro-Technical Council of Ireland: <http://www.etcie.ie/docs/ET215%282008%29.pdf>
- SeawardPrimeTest50Manual:
http://www.seaward.co.uk/products/PrimeTest_50_PAT_Tester.asp
- SWPS 005

Appendix 1

The Guide to the maintenance, inspection and testing of portable equipment (Electrical appliances and tools) in the workplace

[http://www.etci.ie/docs/ET215\(2008\).pdf](http://www.etci.ie/docs/ET215(2008).pdf)

Appendix 2

<u>Name</u>	<u>Area</u>	<u>Contact</u>
Fiona McGovern	Dept. of Applied Sciences	Ext.2793
Sharon Tuohy	Dept. of Nursing, Midwifery and Health Studies	Ext.2622
Allison Murdock-McDonnell	Centre for Freshwater Studies	Ext.2118
Billie Mcilveen	Smooth Muscle Research Centre	Ext.2476
	Netwell Centre	

Field Work	Ref: SWPS056	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

Field work can present a range of hazards including but not limited to;

- Lone working
- Working in hazardous terrain
- Lifting and handling heavy equipment
- Exposure to diseases such as Tetanus and Weil's disease
- Hypothermia
- Slips, falls and trips resulting in cuts, sprains
- Drowning
- Interactions with animals, e.g. cattle, horses, etc

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

To include all expeditions off-site of DkIT grounds by staff and students.

General

Staff arranging field work trips for groups of students must gather information about the hazards associated with the area in which the field work/field trip will take place (e.g. terrain, climate, animals and plants, activities (past / present) in the area). The person in charge of the field trip must evaluate the risks to health, safety and welfare associated with the hazards and inform all participants of the risks identified and safety measures.

The person in charge of the field trip must;

- Carefully plan the itinerary and routes to be taken.
- If applicable, obtain formal permission from the appropriate authorities / landowners to visit sites.
- Ensure participants are aware of appropriate clothing and protective clothing and equipment required.
- First aid, accident and emergency procedures must be put in place

- A first aid kit must be carried at all times.
- Ensure students are familiar with and experienced in compass navigation if required.
- The person in charge must be satisfied as to the fitness and general good health of those participating where this could impact on safety.
- Depending on the location and nature of the field work ensure anti-tetanus injections / boosters are up to date.
- Document details (including telephone numbers) of the relevant emergency services (e.g. Garda, Police, Mountain Rescue, Coast Guard) in the area.
- Leave copies of the proposed itinerary, routes, timetables and vehicles with the Science Office or Senior Technical Officer or nominated member of Staff, who is available on Campus and can, if necessary, implement the emergency plan.

Staff, post graduate or 4th year project fieldwork

Supervisors must obtain a risk assessment for potentially hazardous field work carried out by 4th year and postgraduate students. The risk assessment must identify potential hazards associated with the work and set out what precautions will be taken. The supervisor must approve the fieldwork plan before any fieldwork is undertaken by signing the risk assessment. Approved fieldwork plans and risk assessments developed less than 12 months previous may be used for repeat fieldwork provided that:

- (a) no significant changes to the fieldwork have been made and the existing plan and assessment remain entirely applicable; and
- (b) updated itinerary details are appended and submitted for each fieldwork trip.

Lone working in hazardous terrain such as on rivers, mud flats, beside cliffs and on bogs must be avoided. Lone working in the field should be avoided and students (including postgraduates) must never carry out field work alone. The following guidelines must be followed by 4th year and postgraduate students carrying out fieldwork.

Guidelines for fieldwork

- If going to a remote place, then always leave a note of your whereabouts with a senior technician supervisor or other designated person designated by your supervisor. Information should include: date and time of departure, method of travel to and around the site, proposed itinerary, expected time of leaving the site and return to base, and vehicle identification details. The person to whom these details are given should be told who to contact if you do not return and at what time to raise the alarm.
- If working in mountains, moorlands or unpredictable and extreme environments, hypothermia is

a significant hazard. Wear appropriate to wear footwear with good ankle support and carry warm and waterproof clothing. Carry a map and compass and know how to use them. Carry a whistle and waterproof watch and, where appropriate, a survival bag with extra high-energy food supplies. Carry a mobile phone but do not depend on it as a rescue tool as the signal or power may fail.

- Avoid or abandon outdoor activities in extremely bad weather.
- Consider your personal safety when conducting fieldwork within the vicinity of known or likely trouble spots.
- Take special care when carrying out fieldwork along watercourses, cliff edges, or in areas that contain boggy ground, reedbeds or loose rocks.
- Wear a high visibility jacket or waistcoat when carrying out fieldwork along busy roads.
- Wear a buoyancy aid or life jacket when working in the proximity of a water course. A life jacket should be worn at all times when working on a water body (e.g. on boats or wading).
- Do not cross potentially hazardous sites, such as quarries, ravines and railway lines and do not attempt to climb steep slopes, walls or fences. If you need to do so, take due care and implement cautionary measures. Obtain permission from landowners when crossing private land.
- Heed warning signs and do not enter land that has been deliberately obstructed by fencing or barbed wire, unless you have consulted with the landowner about potential hazards.
- Take special care when entering areas with livestock, especially cattle, rams and horses. Do not enter fields containing bulls and be especially cautious with farm dogs. Rutting deer can also be aggressive in the autumn.
- Avoid undertaking fieldwork in close proximity to working agricultural machinery or forestry operations.
- Avoid confrontation with landowners, land workers or members of the public.
- Carry some form of identification to confirm the activities you are undertaking. If you have any concerns about your personal safety, cease fieldwork immediately.
- Take special care when carrying out fieldwork along watercourses, cliff edges, or in areas that

contain boggy ground, reed beds or loose rocks.

- Wear a buoyancy aid or life jacket when working in the proximity of a water course. A life jacket should be worn at all times when working on a water body (e.g. on boats or wading). Never work alone in a boat or in the proximity of a water course.
- Intertidal areas, including open mudflats and salt marshes, are potentially very hazardous. You should be particularly careful if you need to go below the high water mark: check high tide times before commencing fieldwork and allow ample time to leave the intertidal area. Remember that tides can come in very quickly and that distances can be deceptive on wide, open tidal flats. Small tidal creeks or flows can rapidly deepen on an incoming tide, thus cutting off an apparently safe retreat.
- Areas of very soft sediment should be avoided. A range poll or walking stick should be used to assess the depth of soft mud prior to walking on it. Observe all local warning signs relating to access to intertidal areas.
- Fieldworkers are advised to carry a basic first aid kit to dress any minor cuts and abrasions.
- Care should be taken to avoid causing back injuries through lifting heavy samples and equipment. Personnel undertaking field work should do an approved Manual Handling training course.
- There is danger of overexposure to sun during fieldwork (even in winter) so wear sunblock and a hat. Also wear sunglasses when working on water as the reflection can damage eyes.
- Clean hands with antiseptic wipes after each site visited. This is particularly important if there is any risk of exposure to animal or human faecal matter.
- Fieldworkers may be exposed to disease during survey work. If a disease is suspected, then it is important to inform your doctor that you may have been exposed to diseases associated with outdoor activities. Typical diseases that may be encountered are:
 - **Tetanus** may result from the infection of even minor wounds and scratches with *Clostridium tetani*, a common micro-organism in soil.
 - **Weil's disease**, a severe form of leptospirosis that can be fatal if left untreated. The organism is carried by rats and excreted in their urine, and persists in water such as in puddles in rat-infested places..
 - **Lyme disease**, a bacterial disease transmitted by animal ticks associated with rank vegetation,

which leads to severe symptoms if left untreated. A variety of animals act as hosts for the bacteria, including sheep, deer and pheasants.

- **Tick-borne Encephalitis**, a viral disease carried by animal ticks. Warm forested areas with heavy undergrowth give the greatest risk from ticks in late spring and summer. In Ireland, a related virus is responsible for 'Louping ill', a disease with symptoms varying from a mild flu-like illness to more severe disease requiring hospitalisation.

Vaccinations (e.g. Hepatitis, Diphtheria) may be required for some types of fieldwork, e.g. exposure to faecal waste

Further Information

Glassware	Ref: SWPS057	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

- Cuts
- Lacerations
- Contamination

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person handling the glassware is at risk from the hazard outlined above, except in the case where glassware implodes or is subjected to violent breakage when all persons in the immediate area may also be at risk.

Description

This document is a general risk assessment for the use of laboratory glassware. This risk assessment should be reviewed fully by users of glassware prior to use of such equipment for the first time. Persons handling laboratory glassware may be subjected to a variety of hazards, including:

- Cuts from damaged or broken glass or from forcing tubing, teats or bungs onto glass tubing, pipettes or condensers which break.
- Cuts from flying glass due to implosion following evacuation or mechanical shock or stress.
- Burns from heated glass.

Exposure to hazardous substances following cuts by contaminated glassware.

General

- Only lab grade glassware may be used.
- Broken glassware must be disposed of to a separate bin marked 'Broken glassware'. There should be no bin liner in bin.
- Glassware should be checked for cracks, chips, weaknesses before use by technical officers setting up the practical. Broken or chipped glassware should be taken out of service and disposed of immediately in sharps bins and not into the normal waste bins.
- Glassware must be cleaned thoroughly after each use
- Gloves should be worn when cleaning glassware
- Automatic pipettes with disposable tips should be used in preference to glass pipettes where possible
- Digital thermometers should be used in preference to glass thermometers where possible

Inserting glass tubing in bungs

- Excess force should not be used when passing glass tubing through rubber bungs.
- The glass tubing must be of suitable bore and fire polished.
- Both bung and tubing should be lubricated with water, petroleum jelly, glycerol or washing up liquid.
- Always protect your hands with a cloth when putting a glass tube into a rubber bung.
- Insert by holding the glass with the towel near the bung. Then, with a twisting motion, press the glass gently into the bung.

To remove glass tubing from bungs

- Hand should be wrapped in a heavy cloth or heavy duty glove and excess force should not be used.
- If the glass is valuable (thermometer) and will not come easily then it may be worked out with a cork borer. Otherwise it is safer to discard it altogether.
- If glassware is stored, mounted in tubing for long periods, the rubber perishes and forms an incredibly tight seal with the glass. Such rubber should be removed by cutting the rubber tube just below where the glass reaches into the rubber. The rubber is then cut longitudinally and then peeled back from the glass. If the process is difficult and the glass is not valuable discard the glass.

Cutting glass tubing

- Rotate cloth covered tube on bench against a glass knife or lightly held file.
- Wet scratch and protect hands with a cloth.
- Press thumbs behind mark.
- Pull cloth covered tube with hands by lightly bending back.
- Fire polish or file sharp ends immediately.

Seized stoppers and stopcocks

- These should be released carefully.
- Do not use force.
- Tap gently.
- Heat gently with rotation in a yellow sooty flame or under a hot tap followed by gentle tapping against a wooden surface. This procedure must not be used if the bottle contains a volatile, flammable, an unknown or water reactive chemical, e.g. Na/K. It should only be performed by a competent person.

Lone working/Out of Hours working	Ref: SWPS058	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

- accidents or emergencies arising out of the work, including inadequate provision of first aid
- sudden illnesses
- inadequate provision of rest, hygiene and welfare facilities
- physical violence from members of the public and/or intruders

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

- Any Laboratory / Experimental work carried outside of 8.30 am – 5.00 pm Monday – Friday when there are no persons aware of your work within calling distance.
- Any Laboratory / Experimental work carried out during hours of restricted access during holiday periods (e.g. 5.00 – 9.00 pm Mon-Thurs).
- Any other work undertaken outside of 7 am-10 pm Monday – Friday and during the hours of 9am - 6pm on Saturday, Sunday & Bank Holidays.
- All buildings must be vacated by 4pm on Saturdays and all day Sundays and Bank holidays to allow for full lock up.
- At Christmas & Easter the campus will close down for a specified number of days and access will only be granted under exceptional circumstances.
- Lone working may also include carrying out field work in hazardous terrain or in areas where there is a risk to personal safety.

General

- Lone working in laboratories is not permitted unless a risk assessment has been carried out in conjunction with an academic supervisor and the risk is deemed to be low. Typical low risk work that may be allowed includes work on PCs, microscope work, viewing plates, taking items in and out of incubator.
- The supervisor may allow working on high risk activities if the person is competent (typically an experienced member of staff) and a buddy is in attendance.
- The supervisor may allow work on medium risk activities for competent researchers.
- Competent staff members may do so without a buddy present.
- Postgraduate students who are permitted to work on medium risk activities must do so with a buddy present.

- Where a person is working alone without other persons within shouting distance then a phone or mobile phone must be readily available.
- Field work in hazardous terrain or where there is a risk of personal injury as a result of confrontation must not be carried out alone (see SWPS Fieldwork).
- Hazardous experiments must not be left unattended overnight.
- Non-hazardous experiments left unattended overnight must be fully labelled and technical staff informed.

Out of hours access

- If out of hours work is required permission must be sought from the Research Supervisor or Head of Department.
- All persons requiring 'Out of Hours' access must be aware of what to do in the event of an emergency, i.e. what emergency exit doors are available, how to raise the alarm, where to go etc.
- Persons authorised to work 'Out of Hours' during times of restricted access in holiday periods must notify the Caretaking staff and 'sign-in' before 12.00 noon on the day they require access. They must also sign out on leaving the building.
- Persons authorised to work out of hours must not admit any other person to the building out of hours.
- Where the fire alarm is activated in the building after hours, those evacuating the building must assemble at the building fire assembly point. Otherwise emergency services will assume that they are still in the building.
- Researchers or staff members, who in exceptional circumstances, due to the nature of the research work, require access during lock up must seek authorisation for such access from the Estate Office.

Further Information

Researchers or Staff members who in exceptional circumstances, due to the nature of their research work, require access during 'Lock-Up' must seek authorisation for such access from the Estates Office.

Manual Handling	Ref: SWPS059	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

- Back strain, slipped disc, hernia,
- Lacerations, crushing of hands or fingers.
- Repetitive Strain Injury.
- Bruised or broken toes or feet.
- Various sprains, strains, etc

Person Exposed to Risk

Students Employees Public Contractors Visitors

In the event that poor manual handling techniques or practices are employed the person or persons involved in the manual handling are directly at risk of injury.

Description

Manual handling is defined as the transportation or supporting of a load by one or more employees, and includes lifting, putting down, pushing, pulling, carrying or moving a load, which, by reason of its characteristics or of unfavourable ergonomic conditions, involves risk, particularly of back injury, to employees. The load can be animate (a person or animal) or inanimate (an object).

The risks associated with poor manual handling include:

1. Incorrect methods of lifting
2. Attempted lifting of excessive weight
3. Lifting of loads with sharp or awkward edges
4. Lifting of loads containing hazardous materials
5. Lifting of loads in confined spaces

The main injuries associated with incorrect manual handling are:

1. Back strain and slipped discs
2. Hernias
3. Lacerations and crushing of hands and fingers
4. Musculoskeletal disorders

5. Injured feet
6. Various sprains and strains
7. Exposure to hazardous substances

Controls

- Risk assessments must be carried out on manual handling tasks normally performed by staff. As a rule of thumb an assessment is required where weights are above the guideline weights set out by the Health and Safety Authority and reproduced overleaf in figure 1. The assessment should be in writing and set out on the Manual handling Risk Assessment attached to this procedure.
- All appropriate staff shall be trained in safe manual handling techniques. The training will be specific to the tasks and will take into account the results of the risk assessments. The training will be carried out by a trained manual handling instructor and will include training on assessing the risks associated with manual handling.
- The selection of persons to carry out manual handling or lifting tasks will be based on the training given, age and physical build.
- Where possible measures shall be taken to reduce the amount of manual handling to a minimum and mechanical handling devices supplied and used in so far as is reasonably practicable.
- Portable step platforms shall be supplied and used to access loads at high levels.
- Mobile trolleys shall be used wherever practicable for transporting goods.
- Adequate lighting shall be provided to ensure that visibility is sufficient at all times.
- Typical manual handling tasks carried out in the School which may require assessment include;
 - 3..1 Movement of gas cylinders
 - 3..2 Movement of liquid or glass waste containers
 - 3..3 Carrying large volume water samples
 - 3..4 Moving large items of equipment
 - 3..5 Moving large quantities of paper

Date of assessment:	
<p>Section B – See over for detailed analysis</p> <p>Section C – Overall assessment of the risk of injury? Low/Med/High*</p> <p>Section D – Remedial action to be taken:</p>	
<p>Remedial steps that should be taken, in order of priority:</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 	
Date by which action should be taken:	
Date for reassessment:	
Assessor's name:	Signature:
<p>Further Information</p> <p>http://www.hsa.ie/eng/Topics/Manual_Handling/</p>	

PREGNANT EMPLOYEES	Ref: SWPS060	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The pregnant employee and her unborn child may be at risk if they are exposed to certain hazards, including but not limited to:

1. Hazardous materials (chemical, biological and radioactive agents)
2. Excessive or strenuous manual handling
3. Extremes of temperature
4. Movements or posture that may give rise to excessive fatigue

Description

On occasion Institute employees / students may become pregnant and it is possible that tasks assigned to them may pose a risk to their safety or that of their unborn child. For the purposes of health and safety the term pregnant applies to all gravid women, and breastfeeding mothers up to six months after parturition. In a health science setting the risk may be exacerbated if pregnant employees or students are used for teaching purposes or if excessive physical activity is undertaken.

General

1. Employees are strongly advised to inform their supervisor as soon as is reasonably practicable after they become aware of their pregnancy.
2. A Pregnant Employee Risk Assessment will be conducted for all pregnant employees as soon as is reasonable practicable following confirmation of pregnancy, in order to establish if any of her assigned duties may pose a risk to her safety or that of her unborn child. The Risk Assessment will be carried out by competent person, to be nominated by the Dept. Head / Director.
3. If required the pregnant employee may be referred to the Institute's occupational health physician for further examination.
4. The employees supervisor will keep in close contact with the pregnant employee throughout her pregnancy to ensure that the tasks assigned to her throughout her pregnancy are suitable and do not pose a risk to her or her unborn child's safety.
5. Pregnant employees / students must never be used for teaching purposes in a health sciences setting.
6. Pregnant employees / students must not engage in any heavy lifting especially patient handling

when pregnant unless a risk assessment shows that it is safe to do so.

7. Pregnant employees / students must not operate any nuclear medicine apparatus unless a risk assessment shows that it is safe to do so.

Further Information

- **See Safety, Health, and Welfare at Work (General Applications) Regulations 2007 Part 6 Chapter 2 – Protection of Pregnant, Post Natal and Breastfeeding Employees**

Work Placement	Ref: SWPS061	Approved by: FASC Feb 2011
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		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Students working in a range of settings during their work placement who may be exposed to new hazards which are unfamiliar to them.

General

- It is the policy of the School to remind employers formally in writing that during work placement the host employer is responsible for ensuring a safe work place and practices for the student and that the student must be provided with basic safety induction.
- The safety induction should include an outline of any prohibited activities, any hazardous areas in the workplace, what personal protective equipment is required, what to do in the event of an accident (first aid, reporting accident), what to do in the event of fire.
- Students must abide by the safety rules and policies of the host employer at all times.
- Students must report any physical disability or weakness that may increase the risk of injury on work placement to the host employer and the work placement office (in writing).
- Students must report any accidents or incidents that occur during work placement (in writing) to their host employer in the first instance and also to the work placement office and academic supervisor.
- If the student is unhappy with safety arrangements or feels a task is unsafe in the host work place, s/he should approach the Safety Representative or line manager in the work place. If the situation is not readily resolved then the student should contact the academic supervisor or work placement office.

- Students should not partake in activities that they know are inherently unsafe
- Students on the Psychiatric and Intellectual Disability Nursing Programmes must have training in the management of violence and Aggression in the work place in the first year of their programme
- Students from Nursing, Midwifery and Health studies programmes require vaccination for Hepatitis B. Vaccination is provided by the HSE for Nursing/ Midwifery students on commencement of the programme and is compulsory. Health and Physical Activity (voluntary) and Early Childhood studies students also receive vaccination in stage 1 of the programme. If a student from Health and Physical Activity refuses vaccination they must sign a waiver form.

Personal Protective Equipment (PPE)	Ref: SWPS062	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

PPE refers to but is not limited to; protective coats, gloves, helmets, goggles, footwear, or other garment designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and infection. PPE is defined as "all equipment which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or safety".

General

- Whilst the use of Personal Protective Equipment (PPE) is not a substitute for safe working practices in the laboratory it does play a key part in protecting staff and students against exposure to chemical agents.
- It is the responsibility of lecturing staff to ensure that the correct type of PPE is selected and worn during practical classes by students.
- Postgraduate students must carry out a risk assessment of their activities and identify appropriate PPE in conjunction with their supervisor
- No piece of PPE should be used by any lab worker if it constitutes a risk in itself, or if it contributes to a new risk e.g. the use of latex gloves should be avoided as latex is a sensitising agent.
- PPE should fit the user securely. Poorly fitted PPE in the laboratory setting may allow hazardous agents to come into contact with the wearers' body, e.g. poorly fitted safety glasses.
- All PPE must be suitable for the purpose to which it is being used, e.g. always ensure that glasses worn in the lab are CE/EN marked
- When using more than one piece of PPE the user must ensure that the effectiveness of one piece is not compromised by the wearing of another, e.g. if hearing defenders are worn with safety glasses the hearing defenders should not prevent the safety glasses from fitting properly.
- Heavily soiled PPE must be removed by the user and disposed of or cleaned. This is particularly important if gloves or protective clothing becomes contaminated with biological or chemical agents
- The PPE required for a particular task must be clearly detailed in the risk assessment for that

task

- All PPE used must be CE or EN marked / approved.

Safety Glasses / Eye Protection

- Safety glasses must be worn at all times in the laboratory. Where necessary the use of a full face shield should be considered
- Safety glasses must have integral side protection
- Standard prescription glasses are not suitable as safety glasses
- Contact lenses do not offer any eye protection
- If you wear prescription glasses then they must be covered with over-glasses. Alternatively prescription safety glasses should be worn.
- If damaged in any way safety glasses must be replaced
- Never leave eyewear lying about on benches where they may get damaged. Put them in safe place when not in use.
- Safety glasses provide minimal protection against significant splashing, in such instances safety goggles should be worn

Respiratory Equipment

- There are two major types of respiratory protection. These are masks which 'filter' or 'absorb' airborne contaminants from the air inhaled by the wearer; and masks which provide a pumped supply of clean air to the user. In a laboratory setting respiratory protection should not be required under normal circumstances. It may however be required during spill clean up following a leak of hazardous material.
- Where filter type masks are in use the filter / mask must be rated for the airborne contaminant in question e.g. corrosive; organic; inorganic; particulate etc. It must be remembered that filter type masks offer no protection against atmospheres with low ambient oxygen levels.
- Users of respiratory protection will require a 'fit test' to ensure that the mask worn is providing a seal around its edge.
- Respiratory protection must always be used as a last resort in handling chemical agents.

Laboratory Coats

- Howie style laboratory coats should be worn at all times in chemical laboratories or where potentially infectious agents are used.
- When worn coats should be closed.
- Coats should be laundered on a regular basis and be disposed of when heavily contaminated. Students and staff are responsible for laundering their own personal lab coats. Lab coats worn in the microbiology laboratory should be confined to this area.
- Lab coats should not be worn outside of the laboratories e.g. in the restaurants, staff offices or classrooms.

Gloves

The selection of suitable gloves must be based on the information contained within any relevant Safety Data Sheets and the nature of the exposure to the chemical agent. Gloves are very often the most important personal protective equipment that you can wear when handling chemical agents. There is no protective glove that is impermeable or resistant to all chemical agents. No one material affords protection against all chemicals. For certain chemicals there are no materials that will protect for more than a short period of time after initial contact.

The breakthrough time of gloves following exposure to a chemical agent must be considered. This is the length of time that a glove will provide protection to the wearer following contamination with a specific chemical. As a rule disposable gloves should only be worn once and disposed of after heavy or prolonged contamination. If in doubt as to a gloves suitability for a particular chemical refer to any relevant Safety Data Sheets and if necessary the glove manufacturer.

Butyl Rubber

- Good for many organics, ketones, esters. Poor for aliphatic, aromatic hydrocarbons, halogenated hydrocarbons, petrol.

Natural (Latex) Rubber

- Good for very dilute acids and bases. Poor for organics.

Neoprene

- Good for acids and bases, peroxides, fuels, hydrocarbons, alcohols, phenols. Poor for halogenated and aromatic hydrocarbons.

PVC

- Good for acids and bases, some organics, amines and peroxides. Poor for most organics.

Nitrile

- Good for wide variety of solvents, oils, greases, some acids and bases.

Further Information

- Safety, Health and Welfare at Work (General Application) Regulations 2007 , Part 2 Chapter 3 covers Use of Personal Protective Equipment at work.
<http://www.irishstatutebook.ie/2007/en/si/0299.html>
- European Communities (Personal Protective Equipment) Regulations 1993 provide that PPE may not be placed on the market or brought into service unless it complies with basic health and safety requirements. It is deemed to be in conformity with the Regulations if it bears the CE mark. <http://www.irishstatutebook.ie/1993/en/si/0272.html>

Compressed Gas	Ref: SWPS063	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Hazards

- Explosion
- Fire
- Burns

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

Use and storage of any compressed gas under high pressure can be extremely dangerous if proper gas handling safety procedures are not observed

General

- Persons required to connect and disconnect cylinders must have gas safety training.
- Material Safety Data Sheets must be available for any gas in use in the laboratory. These are stored in the Preparation Room and the Gas Shed.
- Cylinders must be properly marked so that all users are aware of the contents.
- Cylinders must not be stored on escape routes where they may pose a risk in an emergency situation
- Always ensure that the regulator in use is suitable for the pressure contained within the cylinder. Check the pressure rating of the regulator and the indicated pressure within the cylinder.
- Ensure that gas tubing is in good condition and is suitable for the gas e.g. never use natural rubber tubing with O₂.
- Never lay cylinders on their side unless they are empty and are being stored prior to removal off site. Never lay acetylene cylinders on their side, even when empty.
- When using flammable gases remove potential sources of ignition from the laboratory wherever possible.
- Cylinders must always be securely fastened to the bench or a wall.
- The use of PTFE tape to seal joints is prohibited
- The use of oil or greases on cylinder threads is prohibited
- When not in use for extended periods, cylinders should be removed from the laboratory where possible.
- Cylinders must never be left freestanding for any length of time.
- Never attempt to catch a falling cylinder
- The regulator should be closed / turned to zero before opening the cylinder valve at the spindle.

- Repairs to damaged regulators may only be undertaken by a competent service provider.
- Regulators must be serviced on a regular basis, as per the manufacturers instructions. As a general rule an annual inspection with a five year replacement or reconditioning is recommended.
- Regulators must be removed before transporting cylinders, even for short distances
- Correctly sized tools should be used when fitting regulators to ensure no damage to the fittings and a secure fit
- A purpose designed detector fluid should be used to check for leaks around a regulator during initial set up and at regular intervals thereafter.
- Where possible toxic, flammable, corrosive and explosive gases not piped into labs should be used from as small a cylinder as possible, e.g. a lecture bottle in order to facilitate their positioning in fume hoods
- Naked flames must not be used in areas where flammable gases are stored or used and signage to this effect must be erected close by.
- Prior to introducing a flammable gas into a reaction vessel, the equipment must be purged of oxygen by evacuation or by flushing with inert gas at least three times.
- Areas in which compressed gases are in use must be adequately and continuously ventilated
- When a cylinder is not in use the cylinder valve should be closed

Handling & moving

- Cylinders must be handled carefully at all times. All persons handling cylinders must be trained in manual handling techniques.
- Cylinders must be transported using a suitably sized cylinder trolley. Cylinders should be properly secured in the trolley and trolleys should be pushed and not pulled.
- Safety shoes and gloves must be worn when handling large compressed gas cylinders
- Gas cylinders must not be accompanied in a lift. A lift is a confined space and should leakages occur asphyxiation is possible. One person should place the cylinder in the lift whilst another waits to receive it from the lift once the journey is complete. There should be a clearly visible sign on the cylinder warning others not to enter the lift with the cylinder. Where possible a goods lift should be used I don't think we need this section as we don't use the lift to transport gas cylinders, they are all stored externally.
- Cylinders must not be carried in passenger areas of vehicles. Cylinders should be carried in an open vehicle.

Storage

- Cylinders should be stored in well ventilated areas protected from the effects of weather and out of direct sunlight.
- Full cylinders should be stored separately to empty cylinders
- Empty cylinders should be returned to the supplier as soon as possible. Regular supplier delivery and collections should be made to ensure rapid turnover of used stock
- The minimum number of cylinders possible should be kept in storage

- Cylinders must be secured in an upright position
- Flammable / fuel gases such as hydrogen or methane must never be used or stored in the same area as oxygen, unless separated by a distance of 3 metres or a fire-resistant wall.

Gases should be segregated as outlined below

SEPARATE	FROM	BY
Inerts, oxidants, toxics and CO ₂	Flammables / LPG's	3 metres or a fire resistant partition
Flammables	LPG's	3 metres or a fire resistant partition
Toxics	Inerts, oxidants and CO ₂	1

Dealing with leaks

- If the leak is small, attempt to close off the cylinder valve but do not endanger yourself. Eliminate all sources of ignition, ventilate and evacuate the laboratory.
- Beware of approaching a possible hydrogen leak since the gas burns with an almost invisible flame – carry a rolled up sheet of paper in front of you to 'feel' for a flame.
- If the leak is large, evacuate the laboratory and sound the fire alarm
- Following the large scale leakage of an asphyxiating gas e.g. nitrogen, argon etc, do not re-enter the laboratory without permission
- Be aware that gases can accumulate at floor or roof level without detection if leaks are small

Pre Use Safety Inspection

A safety inspection should be carried out before use.

1. Remove regulator from cylinder and disconnect hoses
2. Check date coding not expired
3. Ensure that regulator is clean and free of contamination
4. Check that there is no physical damage to unit
5. Check that there is no damage or dirt in / on bullnose stern
6. Check that there is no damage or dirt in / on outlet connection
7. Check all pointers on gauges read zero
8. Ensure pressure adjusting screw turns freely

9. Ensure P.A. screw captive on regulator body
10. Connect Regulator to Cylinder and Open Cylinder Valve
11. Ensure inlet pressure steady (contents gauge) on cylinder
12. Do a leak test all around regulator
13. Close Cylinder Valve
14. Ensure inlet pressure steady
15. Close Needle Valve and Open Cylinder Valve, Turn P.A. Screw to 50% of Maximum Operating Pressure.
16. Ensure outlet pressure gauges are steady
17. Close Cylinder Valve
18. Ensure all gauges are steady
19. Extend leak test up to needle valve

Further Information

<http://erd.dli.mt.gov/safetyhealth/brochures/compressedgassafety.pdf>

Radioactive Sources	Ref: SWPS064	Approved by: FASC 24 Mar 2017
	Assessed by: FASC 24 Mar 2017	
		Issued by: EH March 2017

Person Exposed to Risk

- Students
 Employees
 Public
 Contractors
 Visitors

Description

The radioactive sources held in the Department of Applied Sciences are low activity sources and the main risk is in the event of theft or fire.

The sources are stored securely in a steel safe so the risk of theft or fire is low. In the unlikely event of the containers becoming damaged, the safe should contain any release.

There is also a risk posed by the possible ingestion of the materials. As the sources are only used under the supervision of a lecturer, the probability of such an occurrence is low.

General

The Department has a licence from the Radiological Protection Institute for the storage and use of sealed radioactive sources which are in Panex Kits. These are stored in the Physics Laboratory Store Room E236. For a full list of sources, see the licence filed in the Science Administration office.

Description of sources in use:

Unique ID of Device	Radioactive Source	Activity of Each Source	Purpose	Serial No. of Source
SK1 1969	Americium - 241	4.6KBq	Higher Education/Research	SK1/1969/S1AM241
	Strontium - 90	4.6KBq	Higher Education/Research	SK1/1969/S2SR90
	Cobalt - 60	185 KBq	Higher Education/Research	SK1/1969/S3CO60
SK2 1969	Americium - 241	4.5KBq	Higher Education/Research	SK2/1969/S1AM241
	Strontium - 90	4.6KBq	Higher Education/Research	SK2/1969/S2SR90
	Cobalt - 60	185 KBq	Higher Education/Research	SK2/1969/S3CO60
SK3 1969	Americium - 241	4.6KBq	Higher Education/Research	SK3/1969/S1AM241
	Strontium - 90	4.6KBq	Higher Education/Research	SK3/1969/S2SR90
	Cobalt - 60	185 KBq	Higher Education/Research	SK3/1969/S3CO60
DK 1969	Americium - 241	4.6KBq	Higher Education/Research	DK/1969/S1AM241
	Strontium - 90	4.6KBq	Higher Education/Research	DK/1969/S2SR90
	Cobalt - 60	185 KBq	Higher Education/Research	DK/1969/S3CO60
	Radium - 226	185KBq	Higher Education/Research	DK/1969/S8RA
	Strontium - 90	185KBq	Higher Education/Research	DK/1969/S9SR90
DK 1987	Strontium - 90	185KBq	Higher Education/Research	DK/1987/SR90
DK 1987	Cobalt - 60	185KBq	Higher Education/Research	DK/1987/CO60

SK1 1987	Strontium - 90	185KBq	Higher Education/Research	SK1/1987/SR90
SK1 1987	Cobalt - 60	185KBq	Higher Education/Research	SK1/1987/CO60
SK2 1987	Cobalt - 60	185KBq	Higher Education/Research	SK2/1987/CO60
SK2 1987	Strontium - 90	185KBq	Higher Education/Research	SK2/1987/SR90
SK3 1987	Cobalt - 60	185KBq	Higher Education/Research	SK3/1987/CO60
SK3 1987	Strontium - 90	185KBq	Higher Education/Research	SK3/1987/SR90
CS137#1	Caesium - 137	37KBq	Higher Education/Research	CS137#1

Storage:

- All sources to be stored in original lead containers in kit boxes.
- When not in class use, kits must be returned to the steel safe in the Physics Store E236.
- E236 is to be kept locked at all times and have a radioactive warning sign on the door.
- The following staff members are authorised to use these sources:

Tony Lennon, Lecturer and Radiological Protection Officer (Ext.2569))

- Matthew Molloy, Physics Tutor (Ext. 2514)Mr. Joe McCreanor, Physics Technical Officer (Ext. 2627)
- Ms. Fiona McGovern. Senior Technical Officer (Ext.2627)

- If any other staff members require the use of these sources, they must obtain the permission of the Head of Department of Applied Sciences.
- Lecturers are responsible for the use of sources during class time and for returning them to their containers. Any deficiencies must be reported to the Head of Department or the Radiological Protection Officer.
- Thefts must be reported to the Head of Department, Gardaí and Institute Board of

Management.

- In the case of fire, the normal fire evacuation procedures are activated, the Fire Department having been advised of the storage locations of the sources.
- Wipe tests must be carried out on all containers at least every 2 years to detect possible leakage.
- Visual inspections of all sources must be carried out on a monthly basis *and logged in the Radiation logbook in NE236.*

Handling and Use:

Undergraduate Physics practical classes:

- All undergraduate students using sources must be instructed beforehand in their safe use and potential hazards (including that of ingestion).
- Sources must only be handled with the metal tongs provided.
- The open end of sources must never be turned towards the users or any person or any part of their person.
- Sources should be used only with the kits and in the experiments for which they are designed.
- No food, chewing gum, etc. must be left in the vicinity of any sources or consumed in the Laboratory or Physics Store Room.
- Sources must be immediately returned to the containers provided when not in use, even if the class has not finished.
- Lecturers must check to see that all sources are accounted for before students are allowed to leave the classroom.
- At the end of the class, students and lecturers should wash their hands thoroughly.
- The lecturer in charge should ensure that the sources are returned to the safe.

Calibration of Gamma Ray Spectrophotometer:

- The Cs¹³⁷ standard is used only by researchers for the calibration of the Canberra Gamma Ray Spectrophotometer in E228.
- The standard should be used in accordance with the relevant Standard Operating Procedure for the Spectrophotometer, with reference to the associated chemical agents risk assessment ('Analysis of sediment for lead 210 and Caesium 137').

Contacts:

Radiological Protection Officer:

Fiona McGovern, Ext. 2793, Head of Department:

Arjan van Rossum, Ext. 2620, Emergency Phone Numbers:

Dundalk Fire Station 042 9334666

Crescent Garda Station Dundalk 042 9335577

EPA – Radiation Protection Regulation Unit 01 268 0100

Further Information

An Intervention Plan dealing with radiological emergency has been compiled and provided to the Co. Louth Fire Safety Officer. This can be viewed in the Science Administration Office (NC140: Health and Safety documentation).

Centrifuges	Ref: SWPS065	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

All persons working in the immediate vicinity of centrifuges are at risk if the centrifuge fails.

Description

This document is a general risk assessment for the use of centrifuges. This risk assessment should be reviewed fully by users of centrifuges prior to use of such equipment for the first time.

Centrifuges can pose a variety of risk to both users and to persons in their immediate vicinity in the event of mechanical failure. If balanced or loaded incorrectly centrifuges may move about during use and possibly fall from laboratory benches. In addition to the risk posed by component parts of the unit any hazardous materials contained within the centrifuge may also pose a risk to operator safety during any failure of the unit.

Controls

1. No person may operate a centrifuge without first receiving instruction in the safe use of that particular model / type of centrifuge. It is the responsibility of laboratory supervisors / managers to ensure that all persons under their control using centrifuges have been trained, and that full records of such training are maintained.
2. Centrifuges must only be used as per the manufacturers' instructions.
3. A log of use must be kept for each centrifuge where deemed necessary by the manufacturers instructions.
4. Each unit must be serviced by a competent person as per the manufacturers suggested intervals.
5. Units must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
6. All centrifuges must be fitted with an interlocking device which cuts the power to the unit motor if the cover is opened. Persons must never try to open the cover when the rotors are still spinning and under no circumstances must persons attempt to slow down spinning rotors by hand.
7. The correct rotors, buckets, adaptors and tubes for each centrifuge must be used.
8. Sample containers must not be overloaded / overfilled.
9. Material loaded into sample tubes must be compatible with the sample tube material, e.g. some solvents can cause tubes to swell and to crack.
10. Swing out rotors must be examined before each use to ensure that the tube holders have been correctly positioned and will not move about during a run.
11. Rotors must be installed correctly on the centrifuge spindle, and any fixing nuts must be tightened (but not over-tightened).

12. The manufactures maximum rotor speed must not be exceeded. Maximum rotor speeds may require reduction as a unit gets older or following damage. Rotor speeds must be reduced when the rotor speed and temperature combination exceeds the solubility of a gradient material causing it to precipitate.
13. The load within the centrifuge must be distributed evenly on the rotor.
14. Where recommended by manufacturers instructions units should be bolted to a solid surface.
15. If present, keys must not be removed from centrifuges that are left running.
16. Where applicable, once a refrigeration cycle is completed the centrifuge should be switched off and the cover left opened to allow any condensation to evaporate.
17. All spillages within centrifuges must be cleaned immediately. Spills of hazardous material must be adequately decontaminated.
18. Rotors must be cleaned, dried and stored upside down following use.
19. Centrifuges and their component parts can be heavy, when being manoeuvred mechanical aids may be required and safe manual handling techniques must be employed (Refer to SWP_ManualHandling).
20. Only chemicals compatible with the rotors must be placed into centrifuges. Anything that may abrade or corrode rotor component parts must not be used in a centrifuge.
21. The centrifuging of a hazardous agent must be subjected to a *Hazardous Agent Risk Assessment*.
22. Hazardous agents should be centrifuged in sealed tubes to prevent the generation of aerosols.
23. In the event of rotor disruption the unit must be isolated from the electrical supply and left to stand for 30 minutes. In the event that non hazardous materials are contained within then the inside of the centrifuge should not be disturbed if at all possible until a representative of the manufacturer / supplier has examined the unit. If the material in the unit is hazardous in nature then cleanup should be performed whilst wearing the appropriate personal protective equipment with a decontamination procedure suitable for the hazardous agent(s) in question. As much of the damaged unit should be retained as possible for future examination.
24. All centrifuges must comply with a relevant CE; EN or BS standard.
25. All centrifuges must be maintained in accordance with the manufacturer's instructions.

Further Information

Autoclaves	Ref: SWPS066	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person operating the autoclave is at greatest risk.

Description

This document is a general risk assessment for the use of autoclaves. This risk assessment should be reviewed fully by users of autoclaves prior to use of such equipment for the first time. The hazards associated with the use of autoclaves are burns from hot surfaces or liquids, slips on spilled liquids and exposure to any hazardous agent being loaded into the autoclave.

General

1. No person may operate an autoclave without first receiving instruction in the safe use of that particular model / type of autoclave. It is the responsibility of laboratory supervisors / managers to ensure that all persons under their control using autoclaves have been trained, and that full records of such training are maintained.
2. Autoclaves must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
3. Instructions for the use of the autoclaves should be clearly displayed on or adjacent to the unit.
4. For non- 'self filling' autoclaves, the water levels must be checked before every use and topped up to the correct level if required.
5. Lab coat and safety glasses must be worn when operating an autoclave. Gloves should also be worn when loading the unit and heatproof gloves and a face shield should be worn when unloading material – to be donned prior to opening the autoclave.
6. The contents of the autoclave should be stacked carefully and baskets or buckets not overloaded.
7. Safe manual handling techniques must be employed to prevent injury when loading and unloading the autoclave (Refer to SWPs *Manual Handling*).
8. The correct programme for the type of material to be treated must be selected.
9. All spills and leakages must be mopped up immediately.
10. All autoclaves must have a functioning interlock preventing the opening of the unit when it is in use.
11. When in use appropriate signage indicating that the surface of the autoclave may be hot should be positioned adjacent to the unit.
12. Users of autoclaves must be aware that items held in autoclaves will still be hot for a period

following completion of the autoclave cycle. When removing material from an autoclave, heat-proof gloves and a face shield must be worn. Items should be removed with great care from the unit to prevent the boiling over of hot liquids.

13. Lids of screw-capped bottles should be loosened before autoclaving to prevent pressure build-up.
14. On occasion media in screw-capped bottles can become superheated and appear to still be boiling when removed from the autoclave. If this is the case do not shake as hot media can “erupt” from the bottle before the lid is fully tightened.
15. Unprotected sharps should not be autoclaved, items such as scalpels, needles or pointed forceps must be adequately protected to prevent injury.
16. Broken or cracked glassware should not be autoclaved unless biologically contaminated, under which circumstances it must be adequately protected / contained.
17. Before opening an autoclave after a cycle users should make sure that the unit pressure gauge has returned to zero.
18. Assistance must be obtained when moving bench autoclaves.
19. Autoclaves must be switched off when not in use.
20. All autoclaves must comply with a relevant CE; EN or BS standard.
21. All autoclaves must be serviced and maintained in accordance with the manufacturers instructions.

Further Information

Bunsen – Gas Burners	Ref: SWPS067	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons working in the laboratory are at risk from the hazards below.

Description

This document is a general risk assessment for the use of Bunsen burners and other gas burners. This risk assessment should be reviewed fully by users of burners prior to use of such equipment for the first time. Bunsen and gas burners pose a risk of burn injuries to person in the laboratory and also of gas leak if equipment is poorly maintained. It is also possible to ignite long hair, loose clothing and hair cosmetic products when using gas burners.

General

1. Person using gas burners must wear a closed properly sized lab coat.
2. Long hair must be tied back and if possible cosmetic products (e.g. hair gels) should not be worn in the hair.
3. Prior to using Bunsen burners the gas tubing must be checked for damage and the ends must be securely fixed onto the gas tap and the burner inlet. Damaged tubing must be removed from service immediately.
4. Flammable materials in use on the bench must be kept in covered containers and at a distance at least 30cm from a lit Bunsen or gas burner.
5. Containers for flammable liquids in use on the bench when burners are in use must not contain more than 50ml of the liquid.
6. Lit burners must not be left unattended. They must be turned off before leaving the laboratory or moving to another area of the laboratory.
7. If using gas burners to sterilise equipment previously dipped in alcohol the excess alcohol must be allowed to run off the equipment prior to inserting it into the flame.
8. Gas flames may not be visible in strong sunlight, if required lights should be dimmed or blinds closed to make the flame more visible.
9. When not in use the flame on a Bunsen burner must be turned to the pilot (yellow) flame setting.
10. Vessels to be heated over gas burners must be securely positioned on tripods or similar.
11. Liquids should be heated in glass / Pyrex vessels only.
12. Flammable liquids must not be heated to a temperature greater than their flashpoints.
13. If the heating of liquids is likely to release hazardous vapours then the process must be carried out in a fume hood.
14. Heated containers must not be handled until they are sufficiently cooled.

15. Be aware that it may take a relatively long time for a gas burner to cool down when turned off. Always leave in a safe area or label appropriately to warn others in the laboratory that the unit may still be hot. Always handle Bunsen burners by the base and not the neck.
16. Ensure when in use Bunsen burners are a sufficient distance from the gas supply points so that melting of the gas supply point is not possible.
17. Always ensure that when in use Bunsen burners are not in a position to ignite their gas supply lines.
18. Gas burners utilising gas cylinders must be fitted with an appropriately rated cylinder and fastened properly to the cylinder. Empty gas cylinders must be disposed of properly.

Further Information

Cold Rooms – Walk-in Freezers	Ref: SWPS068	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons working in cold rooms are at risk.

Description

This document is a general risk assessment for the use of cold rooms and walk in freezers. This risk assessment should be reviewed fully prior to use by first time users. Working in cold rooms or walk in freezers exposes persons to the effects of decreased temperatures i.e. hypothermia. The cold room environment may also pose an additional risk to pregnant employees.

General

1. Work in cold rooms or walk in freezers should be restricted to as short a period of time as possible. If extended periods of work in cold rooms are required (>5-10 minutes) then suitable clothing must be worn, e.g. thermal / fleece jumper, gloves, hat, etc. Short sleeve T-shirts and skirts are not suitable apparel for working in cold rooms.
2. Consideration should be given, where practicable, to the fitting of an alarm within walk in cold rooms which allow persons trapped in cold rooms to summon assistance.
3. All walk in cold rooms must have an internal door opening mechanism which is checked on a regular basis and lubricated as necessary.
4. Out of normal hours work in cold rooms should not be undertaken unless a second person in the immediate vicinity of the cold room has been informed and will search for the person in the cold room in the event that they do not report in at prearranged intervals.
5. Liquid nitrogen or dry ice must not be used or stored inside cold rooms.
6. Pregnant employees should not work in cold rooms for any period of time. Prolonged exposure to cold temperatures can damage the unborn child.

Further Information

Fridges - Freezers	Ref: SWPS069	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person(s) using the unit is at risk.

Description

This document is a general risk assessment for the use of fridges and freezers. This risk assessment should be reviewed fully by users of such equipment prior to use of such equipment for the first time. Freezers pose a risk of cold burns if maintained at a sufficiently cold temperature whilst fridges used to store solvents or other unstable materials may pose a fire risk if they are not spark proof. Both pose a manual handling hazard during loading, unloading and moving.

General

1. Fridges and freezers must be visually inspected on a regular basis and damaged units reported to the laboratory manager / supervisor. Damaged units must be removed from use until they have been examined by a competent person.
2. If a unit begins to behave in an unusual manner, e.g. gets hot, starts to smoke, begins to sound noisy, etc. it must be unplugged and signed 'out of order' until it has been inspected by a competent person.
3. Fridge and freezer plugs should be labelled as to the unit that they power, and if possible should be easily accessible in an emergency.
4. Solvents and unstable materials must never be stored in a non spark proof fridge.
5. If handling material in a freezer below 80°C then cold burns are possible. Thermal gloves must be worn when working at or below this temperature.
6. Spills of material in fridges and freezers must be cleaned up immediately using an appropriate technique.
7. Foodstuffs must not be stored in laboratory fridges or freezers.
8. All items in fridges and freezers must be clearly labelled and where necessary packaged properly.
9. When packing material into freezers persons must take account of the fact that items may become difficult to extricate from the unit if they freeze into place. Heavier items should be stored near the surface of chest freezers.
10. Persons packing material into fridges and freezers must use safe manual handling techniques (Refer to SWPs *Manual Handling*).
11. Fridges and freezers must be emptied and defrosted prior to moving them. Units should be moved by more than one person utilising mechanical aids. A task specific manual handling risk

assessment may be required.

12. All fridges and freezers must be serviced and maintained in accordance with the manufacturers instructions.

Further Information

Ovens	Ref: SWPS070	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person using the oven and any other persons in the immediate vicinity are at risk.

Description

This document is a general risk assessment for the use of laboratory ovens. This risk assessment should be fully reviewed by users of ovens prior to use of such equipment for the first time. Ovens pose a risk of burn injuries to users from the presence of hot surfaces or heated materials. If inappropriate materials are heated in ovens then they may give rise to a fire hazard or the release of toxic materials.

General

1. Ovens must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person. Doors must be capable of closing properly and the thermostat must be functioning properly.
2. Oven plugs should be labelled as to the unit that they power, and should be easy to access in an emergency.
3. Allow materials from ovens to cool before removing. If required thermal gloves should be worn.
4. Ensure that the temperature at which the oven is set is compatible with the material being heated in the oven, e.g. if placing plastic material in the oven the temperature must be set below the plastic melting point.
5. Ovens must not be used to dry or heat any samples that have a flammability risk.
6. Ovens must not be used to heat any samples that may give rise to toxic or corrosive fumes unless the oven is vented suitably.
7. All ovens must be serviced and maintained in accordance with the manufacturers instructions.

Further Information

Microwave Ovens	Ref: SWPS071	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

If used to heat material in an inappropriate manner then all persons in the laboratory may be at risk.

Description

This document is a general risk assessment for the use of microwave ovens. This risk assessment should be reviewed fully by users of microwave ovens prior to use of such equipment for the first time. When in use in laboratory settings microwave ovens may pose a risk to safety if they are used to heat material in an inappropriate manner. Such activity may lead to the generation of fire, explosion or the release of toxic or corrosive vapours depending on the nature of the material being heated.

General

1. All microwave ovens must comply with a relevant CE; EN or BS standard.
2. All microwave ovens must be serviced and maintained in accordance with the manufacturers instructions.
3. Microwave ovens must be checked before each use for damage, especially around door seals. Damaged units must be removed from serviced immediately.
4. When removing hot liquids from a microwave gloves and safety glasses must be worn.
5. Sealed containers must not be overheated as this can generate a pressure build up. If necessary caps should be loosened or replaced with cotton wool or tissue plugs.
6. Containers to be heated must not be overfilled.
7. Any containers placed into the microwave for heating must be capable of withstanding the heat generated without damage.
8. Ovens should be positioned with a 5cm gap around the rear and sides of the unit to allow for adequate ventilation.
9. Liquids to be heated must be well aerated by shaking or pouring before heating to minimize the risk of the fluid boiling over whilst in the oven or generating a delayed eruptive boiling after removal from the oven.
10. Heated liquids must be allowed to stand for at least 1 minute before opening the microwave door to avoid sudden eruptions due to superheating.
11. Ovens should be cleaned immediately following any spillages.
12. Do not use laboratory microwave ovens for heating foodstuffs.
13. If there is a risk that harmful fumes or vapours will be released from the material being heated the oven must be placed into a fume hood.

Homogenisers	Ref: SWPS072	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued byEH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person using the homogeniser unit is at risk from the hazards outlined above.

Description

This document is a general risk assessment for the use of homogenisers. This risk assessment should be reviewed fully by users of homogenisers prior to use of such equipment for the first time. Homogenisers are often used to breakdown biological material before it is subjected to further laboratory processes. If used incorrectly homogenisers may cut or damage users hands or fingers. Users may also be exposed to the material being treated and in some cases to elevated noise levels depending on the model in use.

General

1. All homogeniser units must comply with a relevant CE; EN or BS standard.
2. All units must be serviced and maintained in accordance with the manufacturers instructions.
3. No person may operate a homogeniser without first receiving instruction in the safe use of that particular model / type of homogeniser.
4. Instructions for the use of the homogeniser should be clearly displayed adjacent to the unit or held within any storage box with the unit.
5. Homogeniser must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
6. The wiring on homogenisers should be checked for damage before every use and damaged units must be removed from service immediately.
7. Homogeniser cables should be positioned so that they are unlikely to be 'snagged' in the course of operating the unit.
8. Hands and fingers must never be placed into a homogeniser unless it has been disconnected from the power supply first.
9. When washing the homogenizer blade(s) extreme care must taken as these can be very sharp. If required gloves should be worn.
10. If the unit is being used to process material which contains potentially infectious biological agents then appropriate biological containment measures must be taken, e.g. by isolating the process within a Biological Safety Cabinet.
11. When disinfecting homogenizer components care must be taken to select a disinfectant agent that will not corrode or damage the component parts.

12. Homogenisers must always be started at slow speed and slowly worked up to the operating speed.
13. Homogenisers should be operated on the lowest speed setting capable of completing the task.
14. If the homogeniser in use has a lid then it must be used.
15. The process should be begun with a small amount of material at first, with small amounts of additional material added on an ongoing basis.
16. Users of homogenisers must wear gloves, a closed lab coat and safety glasses.
17. If using noisy units, hearing protection may be required.

Further Information

Hot Plates / Stirrers	Ref: SWPS073	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
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Person Exposed to Risk

Students Employees Public Contractors Visitors

The unit user is at greatest risk from the hazards specified above, although in the event of material splashing or a fire being generated then the risk spreads to all others in the laboratory.

Description

This document is a general risk assessment for the use of hot plate / stirrers. This risk assessment should be reviewed fully by users of hot plate / stirrers prior to use of such equipment for the first time. The chief hazards in using hot plates or heater stirrers are burns from contact with hot surfaces, eye or skin damage caused by slashed liquid and fire caused by heating materials to an excessive temperature.

General

1. Hot plates and heater stirrers must be visually inspected before each use and damaged units reported to the technician. Damaged units must not be used until they have been repaired.
2. Appropriate safety glasses and laboratory coats must be worn when operating hot plates and heater stirrers.
3. Liquids should be heated or stirred in glass / Pyrex vessels only.
4. Stirrers should be turned on only after the container to be heated has been placed onto the plate.
5. Temperature and rotation speed should be increased gradually to prevent over heating or splashing.
6. Flammable liquids must not be heated to a temperature greater than their flashpoints.
7. If the heating of liquids is likely to release hazardous vapours then the process must be carried out in a fume hood.
8. Heated containers must not be handled until they are sufficiently cooled.
9. Hot plates and heater stirrers should not be left unattended when in use.
10. All spillages should be cleaned up immediately.
11. Be aware that it may take a relatively long time for a heated surface to cool down when turned off. Always leave in a safe area or label appropriately to warn others in the laboratory that the unit may still be hot.
12. Ensure that the electrical cable to the unit is not touching the hot plate during use.
13. Units must be switched off when not in use.
14. Hot plates must be serviced and maintained in accordance with the manufacturers' instructions.

pH Meters	Ref: SWPS074	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

The person using the unit is at risk.

Description

This document is a general risk assessment for the use of pH meters. This risk assessment should be reviewed fully by users of pH meters prior to use of such equipment for the first time. Whilst pH meters themselves pose little hazard to users, the fact that they may be used in conjunction with strong acids and bases may pose a risk of chemical burns to meter operators.

General

1. pH meters must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
2. Keep any samples of strong acids or bases close to the pH meter in closed labelled containers.
3. Where possible larger volumes of weak acids or bases should be used for manipulating sample pH as opposed to smaller volumes of concentrated acids or bases.
4. Clean all spills immediately during pH testing and check area with pH paper to ensure that contamination has been removed.
5. Do not insert the pH meter electrode into a container if there is a stirrer in motion.
6. Where applicable MSDS for buffer solutions must be readily available to all pH meter users.
7. pH meters must be maintained in accordance with the manufacturers' instructions.

Further Information

Rotary Evaporators	Ref: SWPS075	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

All persons in the immediate vicinity are at risk if a rotary evaporator fails.

Description

This document is a general risk assessment for the use of rotary evaporators. This risk assessment should be reviewed fully by users of rotary evaporators prior to use of such equipment for the first time. Rotary evaporators pose a hazard in the event of unit failure which can lead to flying glass and release of evaporator contents.

General

1. Rotary evaporators must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person. Users must be vigilant for cracks in glassware.
2. The condenser of the rotary evaporator should be shielded were possible using a plastic mesh or similar.
3. Dreschel bottles must not be used as vacuum traps.
4. Cracked flasks must not be used.
5. Operators must ensure that they empty and clean the solvent collection flask prior to use.
6. Operators must ensure that a good vacuum has developed in the apparatus before spinning the sample to prevent the flask falling off.
7. Users must not hold onto the sample flask when it is rotating.
8. The reintroduction of air back into the system after an evaporation has been completed must be done slowly and with care.
9. The unit should be cleaned after use.
10. All evaporators must be serviced and maintained in accordance with the manufacturers instructions.

Further Information

UV light sources	Ref: SWPS076	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students
 Employees
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Description

This document is a general risk assessment for the use of UV light sources. This risk assessment should be reviewed fully by users of UV light sources prior to use of such equipment for the first time. The use of UV light poses a risk of injury to the eyes or the skin. All radiation of wavelength shorter than 250 nm should be considered dangerous. There are also electrical and fire hazards associated with the use of UV light sources. Some chemicals may also react in the presence of UV light.

General

1. No person may use a UV light source without first receiving instruction in the safe use of that particular model / type.
2. UV lamps / light sources must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
3. All UV light sources must be maintained and serviced as per the manufacturers instructions.
4. When using UV light a lab coat, gloves and eye protection in the form of safety glasses or a face shield rated for exposure to UV light must be worn (BS EN 170:2002 standard). Eye protection must be of the 'UV Absorber' type. Lab coats must be fully buttoned with wrists, arms, upper chest and neck areas covered. There should be no gaps between the end of the lab coat sleeves and the gloves.
5. UV light sources should be located and used in separate areas of laboratories to those used for general work, or if this is not possible then they should be used in a closed box, in a suitably boarded up fume hood or in a curtained off area.
6. Contact time with UV light sources must be minimised.
7. The distance from the light source should be maximised by working at arms length and avoiding stooping over the work surface
8. Chemical agents must not be stored in the immediate area of UV light use.
9. UV lamps can get very hot during use. Always leave in a safe area or label appropriately to warn others in the laboratory that the unit may still be hot. Keep flammable and combustible materials a suitable distance away from light sources.
10. Lone working with UV light sources should be avoided wherever possible.
11. Any users experiencing a sandy or gritty feeling in the eyes or skin-reddening like a sunburn following exposure to UV light must seek medical attention immediately.

Gel Electrophoresis	Ref: SWPS077	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

All persons undertaking electrophoresis are at risk from the hazards specified below. In the event that the process is carried out poorly then all persons in the laboratory may be at risk from exposure to hazardous agents.

Description

This document is a general risk assessment for gel electrophoresis. This risk assessment does not assess the risks posed by the chemical agents used during the process. This risk assessment should be reviewed fully by persons undertaking electrophoresis prior to beginning this process for the first time. Electrophoresis may expose persons to the hazards associated with electricity and may also expose them to the hazardous agents used during the process.

General

1. No person may engage in electrophoresis or use electrophoresis equipment without first receiving instruction in safe electrophoresis techniques and in the use of that particular model / type of unit.
2. Electrophoresis units must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
3. All leads, plugs, power packs, electrodes, etc. must be of the correct type and in good working condition. Any defects must be reported to the laboratory manager / supervisor immediately and the equipment removed from service.
4. All equipment must be maintained and serviced as per the manufacturers' instructions.
5. All electrophoresis equipment must only be used as per the manufacturers' instructions. A copy of the instructions for each type of electrophoresis unit should be available within each department.
6. Users must ensure that their hands are completely dry before attempting to adjust the controls or turn equipment on or off.
7. In the event that any liquid is spilled in the immediate vicinity of the unit then the equipment must be powered off at the mains immediately and the spill dealt with.
8. If the tank or power pack needs to be moved during a run, then the unit must be switched off at the mains.
9. In the event of an emergency the unit should be turned off at the mains.
10. The unit power supply must be turned off before connecting the electrical leads. Leads should

- be connected one at a time and using one hand only (ensure hands are dry).
11. The apparatus must be kept away from sinks or other water sources when in use.
 12. The unit power supply must be turned off when opening the lid or reaching inside the chamber.
 13. All equipment should be of the kind that prevents its operation whenever the user has access to electrodes or the attached conductive solutions. Such safety devices must not be tampered with.
 14. Individual electrophoresis units when in use must be kept far enough apart so that the risk of crossing power lines is eliminated.
 15. Apparatus must be run in a tray that can contain any leakage of conductive solutions. The uncontrolled leakage of conductive solutions is a serious shock risk.
 16. Unattended electrophoresis runs must be avoided where possible. If unattended runs are required then they must be subject to a risk assessment prior to being undertaken and receive approval from the laboratory manager. Unattended runs must have an unattended experiment form adjacent to them detailing the nature of the process and any emergency responses. Persons should avoid running gels overnight, especially if the tank is water cooled from a mains tap. Water pressure can fluctuate and the cooling system may fail presenting a fire risk.
 17. A Chemical Agents Risk Assessment must be undertaken for the specific type of electrophoresis being run, taking account of the types of hazardous agents in use during the process. This assessment must identify control measures for reducing the risk of operator exposure to hazardous agents.

Further Information

Laboratory Pumps	Ref: SWPS078	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons working in the vicinity of pumps are at risk from the hazards outlined below.

Description

This document is a general risk assessment for the use of various laboratory pumps. This risk assessment should be reviewed fully by users of pumps prior to use of such equipment for the first time. The exhaust from laboratory pumps may contain chemical contaminants and oil mist from the pump operation. Some pumps have moving parts that may pose a risk.

General

1. No person may operate a pump without first receiving instruction in the safe use of that particular model. It is the responsibility of laboratory supervisors / managers to ensure that all persons under their control using pumps have been trained, and that full records of such training are maintained.
2. Pumps must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
3. All moving parts of pumps must be guarded so as to prevent workers coming into contact with moving parts.
4. A trap should be used between system and pump to prevent contaminants reaching the pump oil or being exhausted into the laboratory where possible.
5. Pumps that have the capacity to exhaust chemical contaminants should be vented to the outside, be used within a fume hood or have their own local exhaust ventilation.
6. The exhausts of pumps must be free from obstruction.
7. Where possible mercury diffusion pumps should be replaced by oil versions. Mercury pumps must have secondary containment and their use must be subjected to a risk assessment.
8. As far as possible, pump oil should be drained with the pump in a fume hood.

Further Information

Fire Safety	Ref: SWPS079	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

In the event of an outbreak of fire all persons in the immediate area are at risk of injury, whilst there is also a risk of material damage.

Description

There is always an ever-present risk of fire occurring in all workplaces. Common fire hazards include improperly stored combustible or flammable materials, the use of naked flames, faulty electrical equipment, the use of flammable fuels, the use of inappropriate equipment, the build up of flammable materials or wastes in the workplace and smoking in undesignated areas. The accidental release of chemical material may also lead to the outbreak of fire, especially if the material is pyrophoric, extremely flammable or is a strong oxidiser.

The outbreak of fire can lead to:

- Serious bodily injury or fatality
- Damaged property or plant
- Disruption of premises causing loss of facilities

General

1. Refer to SWPs_004_FireSafety

Laboratory Fire Safety

1. As part of a chemical agent risk assessment fire safety provisions for handling the agent(s) in question must be detailed.
2. Flammable materials may only be handled and stored in accordance with the requirements of their Safety Data Sheets, with due regard being paid to their fire risks.
3. Flammable materials must be stored in a suitable storage area. The requirement for low voltage or flame proof wiring should be considered.
4. The large scale storage of flammable materials (>200l / kg) in a single location requires completion of a specific risk assessment prior to storage taking place.

5. Never store more than one day's supply of a flammable at the bench.
6. Overnight storage of flammables should take place in a suitable flammables cabinet.
7. Avoid the purchase of large containers (>5l) of flammable liquids where possible.
8. Do not allow combustible material such as packing material to build up in laboratories.
9. Always ensure that naked flames in the lab are kept well away from flammables.
10. In the event that a flammable liquid spills then all sources of ignition in the lab must be isolated.
11. Persons working in a laboratory setting are strongly encouraged to undertake a training session in practical fire fighting which can be arranged by the FASC.
12. Be aware that some chemicals give off extremely toxic fumes when on fire or heated. Do not attempt to fight a chemical fire unless you are sure that it is safe to do so.
13. The type of fire extinguishant selected to fight a chemical fire must be suitable for the chemical material in question – refer to the material's safety data sheet.
14. If using a carbon dioxide fire extinguisher to fight a fire in the lab be aware that this extinguishant may interact negatively with some lab chemicals.
15. When fighting any fire in a laboratory always be conscious of the risk of the extinguishant knocking over chemical containers.
16. Avoid storing incompatible chemicals that can give rise to violent reactions when mixed in close proximity to each other. Refer to SWPs_032_Chemical Storage and Inventory Control.
17. Ensure that oxidising chemicals are stored in an appropriate manner having consideration to their individual properties and their ability to promote fire in normally stable materials.
18. In laboratories where flammable metals are in use a Class D fire extinguisher may be required.

Further Information

HANDLING AND DISPOSAL OF LAB WASTES	Ref: <i>SWPS080</i>	Approved by: <i>FASC Feb 2011</i>
	Assessed by: <i>FASC Feb 2011</i>	Reviewed by <i>FASC June 2017</i>
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Person Exposed to Risk

Students Employees Public Contractors Visitors

If waste material is handled or stored off in an unsafe manner then all persons in the area are at risk from the hazards exhibited by the waste materials, be they chemical, biological or radioactive. If waste material is not disposed of in accordance with legislative requirements then the Institute and individuals are at risk of prosecution.

Description

All waste produced by the Institutes' laboratories must be disposed of in a safe and legally compliant manner. All waste must be disposed of via a licensed contractor who is approved for the transport and disposal of the types of waste being handled. Failure to do so may leave the Institute at risk of prosecution.

Laboratory waste materials must be separated into 'hazardous' and 'non hazard' materials. The term is used to assess a materials ability to damage the environment, and is not related to its potential impact on human health, e.g. waste electronic goods are considered to be a hazardous waste, yet represent no health risk to humans. In cases where a question as to a waste's status arises the assessment of what constitutes a hazardous or non hazardous waste must be left to a specialist.

As a rule the following should be considered as hazardous wastes:

- Any material contaminated or potentially contaminated with an infectious agent (unless it has been suitably treated to eliminate the infectious agent)
- All human tissues, blood and related swabs and wipes from hospitals or laboratories
- Animal carcasses and dressings from veterinary hospitals / practices
- Microbiological cultures
- Potentially infected waste from pathology or research labs
- Most chemical wastes
- Most electrical wastes
- Contaminated sharps, plastics and PPE
- Empty unclean containers, the previous contents of which are deemed to be hazardous wastes
- All radioactive wastes

General

Chemical Wastes

1. Almost all chemical waste is hazardous.
2. Chemical waste should be disposed of promptly and on a regular basis.
3. Chemical waste should not be allowed to accumulate.
4. Different types of chemical wastes should be segregated where the opportunity arises, e.g. do not mix halogenated with non halogenated solvents if you can avoid it; always separate mercury containing wastes from all other wastes.
5. Do not mix chemical wastes indiscriminately, it can make disposal difficult.
6. Do not mix incompatible wastes together.
7. All chemical waste containers must be clearly labelled as to their contents; the use of expressions such as 'waste solvents' is not sufficient.
8. Waste labels should also be renewed as appropriate as they may become torn or unreadable over time.
9. Waste containers should also be labelled with the date of filling and the name of the producer and / or the laboratory where the waste originated if possible.
10. All sharps must go into suitable sharps bins for disposal. Sharps include broken contaminated glassware. Sharps must never be placed into normal bins.
11. Plastic tips and contaminated plastic waste should be disposed of in the plastics bins provided in each lab.
12. Contaminated gloves should be disposed of in the plastics waste.
13. Where appropriate similar chemicals should be bulked up into larger containers, e.g. bulk compatible waste solvents into 200l drums if possible.
14. Researchers must ensure that all 'products' of research are properly labelled and their properties are fully understood and recorded
15. All persons should be aware of the potential for chemical waste materials to become unstable if left for long periods, e.g. picric acid; 2,4-dinitrophenol; isopropyl ether.
16. Chemical waste must always be stored in a safe manner commensurate with its properties. Refer to SWPS_033Chemical Storage and Inventory Control.

Empty Chemical Containers

1. Containers which have been in direct contact with chemical agents e.g. winchesters, are considered to be a hazardous waste and must be disposed of as if they were full.
2. However if such containers are 'triple rinsed' when empty and all warning labels are removed they may then be classed as clean and container sent for recycling / disposal.
3. The washings generated by this process may be suitable for running down the sink or may require off site disposal – refer to Safety Data Sheet for more information.
4. Over packs that have not come into direct contact with a chemical agent directly can be disposed off through the non hazardous waste route, as long as any chemical names and labels have been blanked off the pack and are unreadable.

Biological Wastes

1. All wastes considered to be contaminated with biological material must be disposed of in an appropriate manner using a licensed service provider.
2. All waste which is potentially 'infectious' is considered to be hazardous waste and must be disposed off accordingly.
3. The following can be considered to be hazardous wastes:
 - All human tissues, blood and related swabs and wipes from hospitals or laboratories
 - Animal carcasses and dressings from veterinary hospitals / practices
 - Contaminated needles, glass, instruments, etc.
 - Microbiological cultures
 - Potentially infected waste from pathology or research labs
4. All sharps must go into suitable sharps bins for disposal. Sharps include broken glassware, blades and syringe tips. Sharps must never be placed into normal bins.
5. All classes of Genetically Modified Organisms other than Class 1 require inactivation (chemical or physical) before leaving site.
6. It is recommended that all biological waste is treated (chemically or physically) before it leaves the Institute in order to render it safe.
7. Biological waste subjected to long term storage must be stored in a secure area. If this area is outside then waterproof sealed or closed containers must be used to store the waste material.

Radioactive Wastes

1. Radioactive biological wastes must be treated and disposed of in accordance with the requirements of any RPII issued licence and the directions of the Institute Radiological Protection Officer.

Non Hazardous Wastes

1. Non hazardous wastes are 'normal' type wastes which are not contaminated with any biological, chemical or radioactive material. Items such as paper towels, tissues, food waste, etc. which does not look like 'laboratory waste' should be sent for recycling or placed into a bin with other general wastes. It is good practice to locate bins for non hazardous wastes outside of laboratories and to use clear plastic bags so that the contents can be easily seen and confirmed as non hazardous prior to disposal.
2. Non contaminated 'laboratory type' waste, such as plastic pipettes, plastic vials, gloves, etc. whilst not hazardous waste, should be placed into a designated bin within the laboratory and disposed of using a licensed waste disposal operator who is aware of the nature of the waste. These items should not be placed into a non hazardous waste stream as they can cause confusion if they appear at a landfill or recycling facility.

Further Information

PERSONAL HYGIENE IN LABORATORIES	Ref: <i>SWPS081</i>	Approved by: <i>FASC Feb 2011</i>
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Person Exposed to Risk

Students Employees Public Contractors Visitors

If poor personal hygiene practices are practiced in the lab then individual workers are at risk of exposure to hazardous agents. In some cases these persons may further contaminate other persons when they leave the lab.

Description

Good personal hygiene in the laboratory is essential in protecting workers against exposure to chemical, biological and radioactive agents. Keep in mind that personal hygiene is important no matter what job is being done. Not only to prevent the growth of bacteria and other organisms on the skin, but as a courtesy to co-workers and patients, students, customers and everybody you might encounter during the work day.

General

1. Adequate welfare and washing facilities must be provided in laboratories where there is a risk of exposure to hazardous agents.
2. Work practices should be designed so as to minimise potential for contact with hazardous agents
3. Suitable personal protective equipment which is properly stored, cleaned as required, is replaced when defective and is separated from normal clothing as necessary should be provided to laboratory workers.
4. Laboratory workers should cover all cuts and abrasions with a waterproof dressing
5. Eating, drinking and smoking are prohibited in all Institute laboratories.
6. All laboratory workers should wash exposed skin following completion of work and before eating, drinking or smoking.
7. When working in the lab personnel should not insert their fingers (or other items e.g. pens) into their mouth or nose or bite their fingernails.
8. Before using a computer or answering a telephone laboratory workers should remove contaminated gloves and lab coats etc were necessary.
9. Laboratory clothing and gloves should not be worn outside of laboratories in common areas or welfare areas unless they pose no risk of cross contamination with hazardous agents.
10. Hand washing: In order to control cross-infection, hands should be washed after performing duties in Lab areas, before continuing on to another area, before and after eating and before and after going to the bathroom. If either soap or hand towels are not available please contact your supervisor immediately or member of cleaning staff to replenish.
11. Proper Hand washing: Massage the cleaning agent, preferably an antiseptic hand cleaner, around

the fingers, the knuckles and hands. Keep hands at a level lower than the elbows when washing to prevent dirty water from running up the arms. Wash vigorously for 15 seconds. Tap water should be running during the process. Dry with paper towel and properly dispose of towel in waste bin provided.

12. A person suffering from any condition that causes them to produce excessive mucosal secretions e.g. colds and flu; or which causes them to sneeze excessively e.g. hay fever; may not be suitable candidates for working with hazardous agents until their condition has improved.

Further Information

WATER / OIL BATHS	Ref: SWPS082	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

The use of water / oil baths poses a risk in that persons may be scalded by the hot water / oil or burned by the steam generated in the bath.

Description

This document is a general risk assessment for the use of water / oil baths. This risk assessment should be reviewed fully by users of water / oil baths prior to use of such equipment for the first time. The use of water / oil baths poses a risk in that persons may be scalded by the hot water / oil or burned by the steam generated in the bath.

General

1. No person may operate a water / oil bath without first receiving instruction in the safe use of that particular model. It is the responsibility of laboratory supervisors / managers to ensure that all persons under their control using water / oil baths have been trained, and that full records of such training are maintained.
2. Water / oil baths must be visually inspected before each use and damaged units reported to the laboratory manager / supervisor. Damaged units must not be used until they have been examined by a competent person.
3. Water or oil must be brought to the boil slowly and simmered gently at the desired level.
4. Persons working with baths of boiling water or oil must stand at the bench or fume hood. When water / oil baths are in use users must not sit at the bench or hood.
5. Users must not lean over baths.
6. If hot water or oil is spilled onto the users lab coat then it must be removed immediately before the hot liquid can permeate through to the skin.
7. If being heated by naked flames the flames must be removed and extinguished at as early a stage as possible. Refer to SWPS_ *Bunsen - Gas Burners*.
8. Baths must be allowed to cool prior to being emptied.
9. Material should be added to / removed from the boiling water using tongs.
10. Racks should not be lifted from the boiling water bath.
11. Do not overfill oil baths. Be aware that oil expands on heating and may overflow the bath if overfilled.

Lasers	Ref: SWPS083	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Depending on the laser class, operators may be at risk while using laser equipment. Bystanders may also be at risk when class 4 lasers are being used.

Description

This document is a general risk assessment for the use of laser equipment. This risk assessment should be reviewed fully by users of Laser Equipment prior to use of such equipment for the first time.

Lasers are classified by their potential to do biological damage. Safety thresholds for lasers are expressed in terms of Maximum Permissible Exposure (MPE). The British Standard sets out seven Classes of laser; these are Class 1, Class 1M, Class 2, Class 2M, Class 3R, Class 3B and Class 4. The higher the Class number, the greater the laser radiation hazard posed by the laser. Class 4 lasers are high power devices, usually needing a mains power supply. Class 4 lasers are used for specific applications in research, medicine and industry. The classifications are as follows:

Class 1

A Class 1 laser is safe for use under all reasonably-anticipated conditions of use; in other words, it is not expected that the MPE can be exceeded. [Comment: This class may include lasers of a higher class whose beams are confined within a suitable enclosure so that access to laser radiation is physically prevented.]

Class 1M

Class 1M lasers produce large-diameter beams, or beams that are divergent. The MPE for a Class 1M laser cannot normally be exceeded unless focusing or imaging optics are used to narrow down the beam. If the beam is refocused, the hazard of Class 1M lasers may be increased and the product class may be changed.

Class 2

A Class 2 laser emits in the visible region. It is presumed that the human blink reflex will be sufficient to prevent damaging exposure, although prolonged viewing may be dangerous.

Class 2M

A Class 2M laser emits in the visible region in the form of a large diameter or divergent beam. It is presumed that the human blink reflex will be sufficient to prevent damaging exposure, but if the beam is

focused down, damaging levels of radiation may be reached and may lead to a reclassification of the laser.

Class 3R

A Class 3R laser is a continuous wave laser which may produce up to five times the emission limit for Class 1 or Class 2 lasers. Although the MPE can be exceeded, the risk of injury is low. The laser can produce no more than 5 mW in the visible region.

Class 3B

A Class 3B laser produces light of intensity such that the MPE for eye exposure may be exceeded and direct viewing of the beam is potentially serious. Diffuse radiation (i.e., that which is scattered from a diffusing surface) should not be hazardous. CW emission from such lasers at wavelengths above 315nm must not exceed 0.5 watts.

Class 4

Class 4 lasers are of high power (typically up to 500 mW or more if cw, or 10 J cm⁻² if pulsed). These are hazardous to view at all times, may cause devastating and permanent eye damage, may have sufficient energy to ignite materials, and may cause significant skin damage. Exposure of the eye or skin to both the direct laser beam and to scattered beams, even those produced by reflection from diffusing surfaces, must be avoided at all times. In addition, they may pose a fire risk and may generate hazardous fumes.

It is strongly recommended that for the use of Class 3 and 4 lasers that a specific risk assessment is carried out.

General

1. No person may operate Laser Equipment without first receiving instruction in the safe use of that particular model / type of Laser Equipment. I
2. Laser Equipments must only be used as per the manufacturer's instructions.
3. A log of use must be kept for each Laser Equipment.
4. Each unit must be serviced by a competent person as per the manufacturer's suggested intervals.
5. All Laser Equipments must comply with a relevant CE; EN or BS standard.
6. All Laser Equipments must be maintained in accordance with the manufacturer's instructions.

The following are a list of general controls for each classification of laser:

Class 1 / 1M

1. A protective housing should be provided
2. If the unit contains an enclosed Class 3 or 4 laser, interlocks should be provided on any removable parts of the housing, or the laser should have a service access panel that is either interlocked or requires a tool for removal

3. If the Maximum Permissible Exposure (MPE) can be exceeded, a temporary laser controlled area should be devised
4. Education and training should be provided for operators

Class 2 / 2M

1. A protective housing should be provided
2. Warning labels should be conspicuous
3. Viewing portals and/or display screens should be designed such that MPE is not exceeded
4. If the unit contains an enclosed Class 3 or 4 laser, interlocks should be provided on any removable parts of the housing, or the laser should have a service access panel that is either interlocked or requires a tool for removal
5. If the Maximum Permissible Exposure (MPE) can be exceeded, a temporary laser controlled area should be devised
6. Education and training should be provided for operators

Class 3 and 4

1. A protective housing should be provided
2. Warning labels should be conspicuous
3. Interlocks should be provided on removable parts of the housing
4. A permanent beam stop or attenuator should be provided
5. If the laser has a service access panel, it should be interlocked or require a tool for removal
6. If the Maximum Permissible Exposure (MPE) can be exceeded, a temporary laser controlled area should be devised
7. Viewing portals and/or display screens should be designed such that MPE is not exceeded
8. If necessary a warning light should be position outside of the room in which the unit is in use to warn pedestrian's not to enter the room when the laser is in use.
9. Education and training should be provided for operators

Further Information

HAND HELD PORTABLE ELECTRICAL TOOLS	Ref: SWPS084	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

The person operating the hand held tool is at greatest risk of injury from hand held electric tools, whilst the creation of ejected material or failure of the equipment may endanger other persons in the immediate vicinity.

Description

This document is a general risk assessment for the use of hand held portable electrical tools. This risk assessment should be reviewed fully by person using such tools prior to the use of same for the first time. The use of the hand held portable electric tools poses a variety of risks including noise, hand-arm vibration syndrome, injuries from flying objects, cuts to hands and legs and electric shock.

General

1. Only authorised and competent persons are permitted to repair or alter electrical equipment.
2. No person may use any equipment unless previously instructed in its safe use.
3. Prior to use all portable electrical equipment must be examined for damage to the unit housing, the cabling and the socket outlet.
4. Where a defect in a hand held electrical tool poses a risk to safety then it must be removed from use.
5. All cable connections must be properly made; under no circumstances is insulation tape to be used for any repair or joint in extension.
6. Hand held electrical tools must be used and maintained in accordance with the manufacturers guidelines and must be suitable for the task for which they are to be used.
7. Safety glasses with integral side protection must be worn when operating cutting tools and where required protective gloves must also be worn when there is a risk of injury to the hands.
8. Ear defenders must be worn when operating noisy hand held electrical tools.
9. Hand held tools must not be used for extended periods of time. Any whitening or blanching of the fingers must be reported to the Supervisor/Dept Head/Research Centre Director immediately.
10. Equipment must be disconnected from the power supply when any repairs or modifications are being undertaken.
11. All portable electric tools to be used indoors must be powered by the domestic 230v electrical supply fitted with a RCD.
12. Long hair must be tied back when operating tools with rotating parts.
13. Loose fitting clothing must not be worn when operating tools with rotating parts.
14. Equipment must not be used if any safety guards have been removed.

15. There must be sufficient light to see the piece being worked clearly.
16. There must be sufficient desk and floor space in order to allow the tool operator a free range of movement.
17. Never leave a running tool unattended.
18. Keep the floors in areas where hand held tools are used free of oil and grease.
19. Do not lean over rotating or cutting tools.
20. The provisions laid down in SWPS *Electricity* and SWPS *Noise* should be adhered to where relevant.

Further Information

Dust	Ref: SWPS085	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Any persons working in a dusty atmosphere or using equipment that generates dust are at risk from the hazards of dust.

Description

This document is a general risk assessment for dust in a workshop type environment. This risk assessment should be reviewed fully by person in such environments where dust is considered a hazard. Inhalation of high levels of nuisance dusts can cause respiratory problems including occupational asthma. The inhalation of relatively low levels of toxic dusts may also pose a risk to the safety of operatives.

General

1. In so far as is reasonably practicable all work processes must be designed so as to minimise dust production.
2. In so far as is reasonably practicable all plant and equipment should be selected so as to minimise dust production.
3. Local exhaust ventilation should be used to extract dust at source.
4. The use of respiratory protection must be avoided unless only for very short periods of time and on an infrequent basis. It is preferable to engineer out the need to wear such protection.
5. If dust is a problem then the systems of work within the workshop must be reviewed.

Further Information

VIBRATION	Ref: SWPS086	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons using vibrating hand tools or operating machinery that vibrates are at risk.

Description

This document is a general risk assessment for exposure to vibration in a workshop type environment. This risk assessment should be reviewed fully by person in such environments where vibration is considered a hazard. The repeated use of plant and equipment that vibrates, especially hand held electric power tools, may lead to the development of Hand Arm Vibration (HAV) or Whole Body Vibration (WBV), which can cause muscle, nerve, vascular and joint damage.

General

1. When purchasing new equipment preference should be given to the selection and use of those pieces of equipment with reduced vibration.
2. All equipment must be properly maintained to ensure that vibration is kept to a minimum.
3. When using hand held tool the hands must be kept warm and regular breaks must be taken.
4. Any whitening of the fingers must be reported to the Supervisor/ Dept. Head or Research Centre Director.
5. Exposure to vibrating tools and machinery must be kept as short as possible.

Further Information

Chapter 2 of Part 5 and Schedule 6 to the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007)

NOISE	Ref: SWPS087	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Any employee exposed to loud equipment when it is in operation may be exposed to noise levels that could potentially cause harm.

Description

The major hazard from extended exposure to loud noise is the gradual permanent damage to the worker's hearing, leading ultimately to occupational deafness. Short-term exposure to loud noises can have a cumulative effect, also leading to occupational deafness. Employees/students may be exposed to noise from equipment in use in their immediate area or from equipment that they themselves are using.

General

1. Where employees/students are concerned that noise levels in their workplace could be excessive then they should contact their Supervisor/Dept. Head or Research Centre Director who will arrange noise level assessment in their work area. As a rule of thumb if normal conversation cannot be carried out at a distance of two metres or more then ambient noise levels may be excessive.
2. If following noise monitoring it is deemed necessary based on legislative requirements the Institute will take appropriate measures to ensure that employees receive adequate information and where relevant training concerning:
 - The potential risks to their hearing arising from noise exposure
 - The measures taken by the Institute to reduce exposure
 - The wearing of personal ear protectors and the role of checks on hearing
 - If following noise monitoring it is deemed necessary based on legislative requirements the Institute will post signs that are clearly visible and easily legible stating the noise level at that work place and the fact that ear protectors are available and must be worn by workers in that area.
3. If following noise monitoring it is deemed necessary based on legislative requirements the Institute will take appropriate measures to ensure that employees are provided with annual hearing tests.
4. Access to areas where noisy areas shall be restricted to necessary personnel only.
5. Exposure to areas where sound levels are considered to be relatively high must be kept as short as possible.
6. Where practicable consideration should be given by persons purchasing equipment to the selection of equipment with reduced noise levels.
7. As a rule hearing protection should be worn when conducting any of the following tasks:

- Operating hand held electrical cutting, grinding and drilling tools
- Driving tractors or ride on lawnmowers
- Operating compressors or generators
- Working in plant rooms
- Venting pressurised cylinders

Further Information

Chapter 1 of Part 5 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007)

Housekeeping	Ref: SWPS088	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
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Person Exposed to Risk

Students Employees Public Contractors Visitors

In the event of poor housekeeping all persons in the workplace are at risk. If poor housekeeping leads to a fire or prevents the safe exit from the workplace in an emergency then all persons in the building concerned are at risk of injury.

Description

Poor housekeeping poses a variety of risks to the health and safety of workers. Workers may slip, trip, or fall over material and / or they may collide with inappropriately placed material. The obstruction of exit routes by poorly stored material can result in delayed escape in an emergency whilst improper stacking of objects can lead to objects falling on persons. Inadequate and infrequent disposal of combustible materials can also represent a fire risk.

General

1. All work areas must be kept clean and tidy at all times. Employees have a duty to keep their immediate work area as clean as possible.
2. All pedestrian and vehicular routes must be kept clear from obstructions.
3. All spillages in the work area must be cleaned up immediately.
4. All workplace must be adequately lit. Defects in lighting fixtures must be reported to the Estates Office immediately.
5. All defects in lighting or flooring or in stair handrails must be reported to the Estates Office immediately.
6. All signs of vermin should be reported at once to the Estates Office.
7. All electrical wiring in the workplace must be neatly tied off so as not to present a trip hazard. Where such wiring must run across floors it must be protected by ramps, conduit or armouring. This is especial important in situations where extension leads are in use.
8. Office equipment and their surrounds should be kept clean and tidy.
9. Sufficient refuse bins must be provided and should be emptied on a regular basis. All refuse must be properly stored prior to disposal.
10. Where floors are being cleaned and are wet suitable warning signage must be positioned in the affected area.
11. Articles must not be placed at a height in a location, where if they fall, they can strike persons below.
12. The stacking of goods must be done so that the risk of items falling is minimised. Material must

not be stacked except where absolutely necessary. In such cases stacked material must not be higher than 1.5 metres, and must involve light materials only.

13. Combustible materials must not be allowed to build up in the work area, especially in areas where there is a potential for the generation of ignition sources.
14. Equipment must be arranged within the workplace so that there is sufficient room for persons to move about the workplace safely.
15. Articles that may pose an increased risk under fire or other emergency conditions (e.g. compressed gas cylinders) must not be stored on exit routes or in areas where they may pose a threat to employee safety.
16. All employees are reminded that under current legislation that they have a statutory obligation and duty of care not to endanger the safety of themselves or their co-workers whilst at work through any act or omission that they may make, including poor workplace housekeeping.

Further Information

- [http://www.hsa.ie/eng/Topics/Slips_Trips_Falls/Slips, Trips and Falls.html](http://www.hsa.ie/eng/Topics/Slips_Trips_Falls/Slips,_Trips_and_Falls.html)

HANDLING AND USE OF FLAMMABLE LIQUIDS / ORGANIC SOLVENTS	Ref: SWPS089	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
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Person Exposed to Risk

Students Employees Public Contractors Visitors

In the event that solvents are spilled or released then all persons in the immediate area are at risk of temporary narcotic effects, especially if the material is very volatile. Solvents also place persons in the immediate vicinity at risk in the event of a fire or explosion, especially those with low flash points and wide explosive ranges.

Description

This document is a general risk assessment for the use of flammable liquids / organic solvents. It should be reviewed fully by users of such material prior to use of such chemicals for the first time.

In respect of known carcinogens or mutagens a specific risk assessment **must** be conducted.

Flammable solvents are commonly used in laboratories and industrial processes. Many are carbon based and are known as 'organic solvents'.

Health Hazards

The main route of exposure to solvents is through the inhalation of vapours given off by the solvent. Most solvents are highly volatile and will readily produce vapours under normal atmospheric conditions. Short-term exposure to solvent vapours will produce a narcotic response caused by the depression of the central nervous system which is usually reversible. Long term exposure or repeated exposure to solvent vapours may cause permanent damage to the central nervous system, the liver and other organs depending on the nature of the solvent exposed to. Some solvents are known carcinogens. Symptoms of acute exposure to solvent vapours include nausea, euphoria, vomiting, headache and in high enough concentrations unconsciousness and death. Solvent exposure may also result in an inability to think clearly. Persons handling solvents should exercise vigilance in recognising these symptoms in themselves and in others. Persons may also be exposed to solvents via direct skin contact with the material. Solvents may irritate the skin, the respiratory tract and the eyes. Prolonged or repeated skin exposure can cause permanent skin damage.

Flammability Hazards

Most solvents are highly flammable. The following characteristics of solvents are important when

determining their fire risk:

Boiling Point: This is the point at which a solvent vaporises. The lower the boiling point the greater the amount of vapour given off by a solvent under normal laboratory conditions. The ability of a solvent to produce vapour is also affected by its surface area relevant to its volume and any other materials that it may be mixed with.

Flash Point: This is the lowest temperature at which the application of a flame to a solvent vapour will produce a flash. A solvent with a flash point of 23°C or less is considered to be highly flammable.

Explosive / Flammability Limits: This is the range of concentrations in air of a solvent vapour that will support combustion or within which there is a risk of an explosion on the application of an ignition source. As a rule, the greater the range the more hazardous the chemical. For example *Toluene* has an explosive range of 1-7% in air, i.e. an atmosphere that contains toluene vapours at a concentration of between 1% and 7% will explode / ignite if a flame is applied.

Autoignition Temperature: This is the temperature at which a solvent's vapour in air will spontaneously catch fire while within flammability limits.

Vapour Density: This is a solvent vapours density relative to air; a vapour density of less than 1 means a solvent's vapour will rise; while greater than 1 means that a solvent's vapour will sink and may collect along on the floor and in ducts and drains.

General

1. When handling solvents a Material Data Safety Sheet must be readily available for consultation as required. Users should make themselves aware of the properties of each solvent that they use.
2. Many individual solvents have a number of commonly used names, whilst many solvents have similar sounding names. Users must ensure that they know which particular solvent they are handling.
3. No more than one day's supply of a solvent should be stored at the bench or outside of a designated flammables cabinet.
4. When using solvents work processes must be designed so as to minimise the amount of vapour given off by the solvent. Solvent Winchester's should be closed when not in use and open containers used to hold solvents should have as small a surface area as possible. Users should never lean over an open solvent container.
5. Where a large amount of vapour may be released or where the solvent in question is a known carcinogen then it must be handled in a fume hood. A specific risk assessment must be undertaken

for the use of any known carcinogen or mutagen.

6. Solvents should not be allowed to come into contact with a user's skin. Persons handling solvents should wear appropriate gloves to prevent skin contact. The nature of the glove to be worn will be dictated by the solvent in use, as some solvents readily pass through some glove materials. The use of barrier creams must only be considered in situations where gloves cannot be worn. A lab coat and safety glasses should also be worn. Contaminated gloves must be removed immediately and disposed off. Heavily contaminated lab coats should be removed and / or laundered or disposed off.
7. When a toxic or similar agent has been dissolved in a solvent particular care must be taken to prevent the solution coming into contact with the user's skin.
8. Pregnant and breastfeeding women must not work with solvents unless a full risk assessment has been undertaken.
9. Persons must not enter confined or restricted spaces where it is suspected that solvent vapours may have gathered.
10. Persons working with solvents should be aware of the symptoms of solvent vapour exposure (i.e. nausea, euphoria, vomiting, headache, confusion) and cease work immediately if they develop any of the symptoms. Persons should also be vigilant for the development of such symptoms in co-workers.
11. When working with solvents as many potential sources of ignition as possible must be removed from the immediate area.
12. Persons handling solvents should be aware of the potential for solvent vapours to collect in roof spaces (for solvents with a vapour density of <1) or in floor openings (for solvents with a vapour density of >1). The ability of a solvent vapour to travel far from a source and 'flash back' if it encounters an ignition source should be considered when designing work processes involving solvents.
13. In so far as is practicable solvents should be dispensed from their original containers using a purpose designed nozzle. The decanting of large volumes of solvents should be done in fume hoods or in the open air.
14. Solvents should be stored in air tight containers in a flammables cabinet away from potential sources of ignition, heat and incompatible chemical agents (particularly oxidisers).
15. Vessels that appear to be empty but which previously contained solvents should not be considered to be free from vapour until they have been suitably washed.
16. Users should wash their hands following handling solvents and prior to eating or drinking.

Emergency Response

In all emergency situations all relevant Material Safety Data Sheets must be consulted for detailed information.

Fire

In the event of a solvent fire the building fire alarm must be sounded. Only trained persons may fight a solvent fire and only if they are able to do so without placing themselves in any danger. As a rule foam fire extinguishers (red cylinders with cream labels) should be used for dealing with solvent fires, or

where these are not available dry powder (red cylinders with blue labels) may be used. Water must not be used on a solvent fire. It is also important to ensure that other nearby solvent containers are removed or are kept cool during any fire (water may be used for cooling purposes). Reference must be made to a solvent's MSDS for more material specific information.

First Aid

- Inhalation: Following exposure to a solvent vapour affected persons should be removed from the source of exposure to fresh air – at no time should persons place themselves at risk when trying to remove affected persons from the source exposure. If breathing stops then artificial respiration should be administered. If available, oxygen may also be administered. Any exposure which results in vomiting or unconsciousness must be referred to a medical practitioner.
- Skin Contact: Remove any contaminated clothing and wash (not scrub) the skin with soapy water. If the skin blisters, or becomes reddened, then seek medical advice.
- Eye Contact: Wash out eyes with copious amounts of fresh water and seek medical advice.
- Ingestion: Refer to the specific MSDS. Always seek medical advice.

For further information contact the National Poisons Information Centre, Telephone 01-809 2566 / 837 9966

Spills or leaks

In the case of a spill or leak the following procedure should be followed:

- All possible sources of ignition, including electrical appliances, should be turned off if safe to do so.
- For large spillages the Dept. Head or Director must be informed (>10L).
- Windows exiting to the outdoors may be opened to facilitate the airing of the affected room.
- The relevant MSDS for the material in question should be consulted.
- The source of the leak should be ascertained and if possible and safe to do so closed or sealed. Any damaged containers should be removed and repackaged if possible.
- Any spilled material should be mechanically confined using suitable containment booms. The spill should be absorbed with a suitable dry media. The spillage must not be allowed to spread.
- Any resultant waste should be swept up and disposed off appropriately.
- When dealing with spillages the inhalation of large amounts of vapour should be avoided. In the event that a large amount of material is spilled then specialist assistance may be required. Respiratory protection may be required when dealing with large spillages. Persons must note that non air fed respiratory protection is not a substitute for decreased oxygen levels.

Further Information

A suitable spill kit containing containment booms, a dry absorbent and a pan and brush for sweeping up contaminated material should be maintained in areas where large amounts of solvents are in use.

USE AND HANDLING OF ARTIFICIAL BLOOD AND URINE	Ref: SWPS090	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons making the solutions and handling the finished product may be at risk.

Description

Artificial blood and urine may be created within the School of Health + Science area for teaching purposes. Uric acid, hydrochloric acid and sodium phosphate are used in their creation. On occasion bovine haemoglobin may also be added. The use of these chemicals may place users and handlers at risk. Note that there is no infection risk from artificial blood or urine.

Uric Acid

- Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 1999/45/EC.

Hydrochloric Acid 37%

- Corrosive
- Risk phrase(s) R34 Causes burns / R37 Irritating to respiratory system.
- Safety phrase(s) S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. / S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Sodium Phosphate

- Corrosive
- Risk phrase(s) R34 Causes burns
- Safety phrases: 26-36/37/39-45 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Bovine Haemoglobin

Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 1999/45/EC

General*Making Solutions*

1. A *Material Data Safety Sheet* must be readily available for each chemical in use at all times.
2. Persons making the solutions must be familiar with the contents of said MSDS.
3. As weak a solution as possible of acids should be used during the process.
4. Chemical agents must not be allowed to come into contact with the user's skin. Suitable PPE must be when making the solution i.e. lab coat, safety glasses and gloves.
5. The final solution must be as weak as possible i.e. acids to be diluted to as low a level as possible.
6. When making the solution always add the acid to any water solutions. Never add water to an acidic solution.
7. Working processes must be designed so as to minimise the amount of contaminants given off. If necessary the process should be carried out in a fume hood, although if weak acids are used this should not be necessary.
8. Pregnant and breastfeeding women must not work with any chemical agents unless a full risk assessment has been undertaken.
9. Persons making the solutions must be aware of the symptoms of exposure to acids and cease work immediately if they develop any of the symptoms i.e. burns, respiratory difficulties, skin rashes. Persons should also be vigilant for the development of such symptoms in co-workers.

Handling / Use Of Working Solutions

1. If possible gloves should be worn when the solutions are likely to come into contact with a persons' skin.
2. If any user develops a skin rash anywhere on their body or any respiratory illness they must cease using the solutions and contact their supervisors immediately.
3. Solutions must be kept away from user's eyes and mouth.
4. The solutions are not considered to represent any significant risk to user's health and safety.

General Chemical Safety Risk Reduction Measures

1. Chemicals should be stored in air tight containers when not is use.
2. All chemical storage containers must be labelled as to their contents.
3. All corrosive compounds must be stored in a suitable manner away from incompatible materials.
4. There must be no eating or drinking in areas where chemicals are handled.
5. Users should wash their hands following the handling of any chemical and prior to eating or drinking.
6. Bottle carries should be used for transporting glass bottles.

7. When not in use containers should have their lids replaced.
8. A high standard of housekeeping must be maintained in the laboratory at all times.
9. All chemical waste must be disposed of in a suitable manner.
10. Refer to SWPS *Use and Handling Of Chemical Agents*).

Further Information

Zoonoses	Ref: SWPS091	Approved by: FASC Feb 2011
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Person Exposed to Risk

Students Employees Public Contractors Visitors

Persons coming into direct contact with animals are at the greatest risk, although poor personal hygiene measures may allow infectious agents to pass from person to person.

Description

This document is a general risk assessment for zoonoses. This risk assessment should be reviewed fully by persons who have concerns regarding workplace zoonoses. Domestic and farm animals may carry a range of diseases, some of which can also affect humans. These diseases are known as zoonoses and some of these diseases may pose a risk to persons working with animals.

General

1. The principle means of guarding against zoonoses in the workplace is through the implementation of good personal hygiene practices. To this end all persons working with animals must:
 - Cleanse or wash their hands after handling animals and prior to leaving their workplace or using the telephone, computer or any other equipment
 - Not insert their hands or fingers or any pieces of equipment e.g. pens, into their mouth / eye / nose / ears whilst working with animals
 - Cover all cuts, abrasion and skin lesions with a waterproof dressing at all times.
2. A person suffering from any condition that causes them to produce excessive mucosal secretions e.g. colds and flu; or which causes them to sneeze excessively e.g. hay fever; may not be suitable candidates for working with animals until their condition has improved.
3. Pregnant and breastfeeding individuals must not work with any animals until they have informed their Head of Dept. or Head of School and a *Pregnant Employee Risk Assessment* has been conducted to assess whether or not their work with animals may pose a risk to their safety, the safety of their unborn child or the safety of their breastfed child.
4. Immunosuppressed individuals and any persons suffering from any medical condition that may render them more susceptible to opportunistic infections must inform their Head of Dept. and must not work with any animals until they have consulted with the *Occupational Health Practitioners*.
5. Food must not be consumed in animal holding areas.
6. The use of tools likely to cause cuts and abrasions should be avoided in so far as is practicable when working with animals.
7. In so far as is practicable skin should be covered when working with animals.
8. Protective clothing worn when working with animals must be removed before entering welfare areas.

9. Where necessary protective work wear should be laundered on site and not removed / brought home by workers.
10. Areas in which animals are held must be kept in a hygienic condition.
11. Animal derived wastes such as afterbirths and soiled bedding must be disposed of in an appropriate manner.
12. Any person who suspects that they have been infected with zoonoses must inform their Head of Dept immediately.

Common Zoonoses

Escherichia coli 0157

Bacterium that lives in the gut of animals, including cattle, sheep, deer and goats and is also carried by pets and wild birds. Can cause illness in humans ranging from diarrhoea to kidney failure and in some cases death. Infection can be caused by contacting contaminated faeces and then introducing the bacterium into the mouth. It is vital that anyone who works with or touches animals thoroughly washes their hands and arms before eating, drinking or smoking and observes good personal hygiene practices.

Cryptosporidiosis

This disease is caused by a protozoan called *Cryptosporidium parvum*. It is carried by calves, lambs, deer and goats and may be transmitted to humans by contact with animal faeces. It may cause diarrhoea and abdominal pain with 'flu-like symptoms for up to six weeks in humans. Again good personal hygiene practices are key to preventing worker exposure.

Leptospirosis

Leptospirosis may be caused by two types of bacterium; *Leptospira icterohaemorrhagiae* which causes rat associated Leptospirosis and *Leptospira hardjo* which causes cattle associated Leptospirosis. Cattle-associated Leptospirosis is usually contracted after cattle urine has splashed into the eyes, nose or mouth, after urine or placental products have entered the body through broken skin, or after inhaling droplets of urine. To avoid infection persons working with cattle should avoid being splashed with cattle urine and wear suitable protective clothing when assisting in calving. In some cases the disease can be carried by cats and dogs so good personal hygiene practices at all times when handling all animals are key to preventing worker exposure.

Bovine Tuberculosis

Bovine TB can infect humans and is spread by inhalation or hand to mouth contact. People handling infected animals are at risk, especially if they become contaminated with mucus from the respiratory

tract and subsequently not follow good personal hygiene practices. The disease may manifest itself by cough, sputum production, anorexia, weight loss, malaise, fatigue, fever, and chills in humans. Some persons will have been immunised against TB in childhood (the 'BCG' immunisation) and this gives a significant degree of protection but does not offer complete protection. However vaccination should not be considered as providing complete protection. Persons working with cattle should always follow good personal hygiene practices and avoid mucosal secretions from animals.

Salmonella spp

The salmonella bacterium can be carried by many types of animals and infection in humans can result in diarrhoea, fever and abdominal pains. Human infection is normally due to contact with contaminated faeces and subsequent hand to mouth contact. Once again good personal hygiene practices are essential.

Streptococcus suis

S. suis is a bacterial infection carried by pigs which can be contracted by humans through cuts and grazes, or possibly by inhalation, and may result in meningitis or death. Once again good personal hygiene practices are essential to prevent human infection.

Orf

Orf is caused by a virus carried by sheep and goats (lambs pose a significant risk) and may cause face, hand or arm ulcers in humans who come into contact with lesions on infected animals. Good personal hygiene practices are essential to prevent human infection.

Ovine chlamydiosis (enzootic abortion of ewes - EAE)

EAE is caused by the organism *Chlamydia psittaci* which is carried by sheep and possibly goats. Infection in humans can lead to abortion or flu like illnesses. It is normally passed to humans during handling or contact with infected afterbirth. Pregnant women should thus avoid working around pregnant ewes.

Psittacosis (Ornithosis)

This disease is also caused by the organism *Chlamydia psittaci* and is often carried by birds. Infection in humans can give rise to a flu like illness which can subsequently lead to pneumonia and in severe cases endocarditis (inflammation of the heart chambers), hepatitis and death. It is usually transmitted to humans by inhaling dust or aerosols from infected faeces or a nasal discharge from infected birds. A

high standard housekeeping when handling or caging birds is important in controlling transmission. Good ventilation in areas where birds are kept and the avoidance of dry sweeping of bird cages are important in preventing transmission.

Q fever

Q fever is caused by *Coxiella burnetii* and may be carried by sheep and cattle. In humans it usually causes mild symptoms e.g. chills and headache, but fatalities have been recorded. It is transmitted by contacting infected animals or their products. Therefore the adherence to good personal hygiene practices is essential in eliminating exposure.

Ringworm

Ringworm is a fungus which may infect cattle, pigs, sheep, horses and dogs. In humans, inflamed swollen crusty skin lesions form on the hands, forearms, head and neck of infected persons. These are caused by fungal spores entering the skin through cuts and abrasions. Spores may be

transmitted to the skin from handling infected livestock or equipment such as gates that animals have rubbed against. Good animal holding area hygiene and personal hygiene practices are necessary to reduce transmission.

Bovine spongiform encephalopathy (BSE) /variant Creutzfeldt Jacob Disease (vCJD)

BSE is widely regarded as a food-borne zoonosis. However it is still prudent to take a precautionary approach when handling *Specified Risk Material* (see below). Good personal hygiene and laboratory practices should be followed at all times.

Specified Risk Material

Cattle

All ages

The tonsils, the intestines, from the duodenum to the rectum, and the mesentery.

Over 12 months

Skull excluding the mandible but including the brains and eyes, and spinal cord.

Sheep and goats**Over 24 months**

Vertebral column, excluding the vertebrae of the tail the spinous and transverse processes of the cervical, thoracic and lumbar vertebrae, the median sacral crest and the wings of the sacrum, but including the dorsal root ganglia

All ages

The spleen and the ileum

Over 12 months (or permanent incisor erupted)

Skull including the brains and eyes, tonsils, spinal cord.

Toxoplasmosis

A *Toxoplasma* infection can occur in humans who swallow cat faeces from a *Toxoplasma* infected cat that is shedding the organism in its faeces. This may occur if cat faeces are allowed to come into contact with a workers hand and it is then transferred to the mouth. Severe toxoplasmosis may cause damage to the brain, eyes, or other organs. To prevent infection good personal hygiene practices are essential.

Actinomyces

Actinomyces bacteria can cause a chronic bacterial disease localized in the jaw, thorax or the abdomen. It can infect humans, cattle, horses and other animals. It is spread to humans by infected aerosols or particulate matter. Good personal practices are essential.

Bartonella henselae (cat scratch fever)

Cat scratch fever is a bacterial disease caused by *Bartonella henselae*. Most people with cat scratch fever have been bitten or scratched by a cat and developed a mild infection at the point of injury. Lymph nodes, especially those around the head, neck, and upper limbs, become swollen. Additionally, a person with cat scratch fever may experience fever, headache, fatigue, and a poor appetite. Persons handling cats should take care not to get scratched or bitten.

Campylobacter

Campylobacteriosis is an infectious disease caused by bacteria *Campylobacter*. Most people who become ill with campylobacteriosis get diarrhea, cramping, abdominal pain, and fever within 2 to 5 days after exposure to the organism. Many animals can have *Campylobacter* in their faeces. Simple contact with infected faeces can lead to human infection. Good personal hygiene practices are essential.

MRSA

Animal and human strains of *Staphylococcus aureus* are usually different and are particularly adapted to colonising and / or infecting their preferred host species. For example, the staphylococci that commonly infect and colonise dogs are usually from a different species, known as *Staphylococcus intermedius*, which differs in certain characteristics from *Staphylococcus aureus*. Although strains of *Staphylococcus aureus* may have a preferred host species, they may opportunistically infect other species in some circumstances. Animals carrying or infected with MRSA could be regarded as equivalent in risk to human carriers or patients infected with the organism. Good personal hygiene practices are essential along with the isolation of known cases.

Brucellosis

Transmission of brucellosis between infected animals and humans occurs primarily through ingestion, direct contact via skin abrasions and mucous membranes and inhalation. Risk factors include contact with infected tissues, blood, urine, vaginal discharge, aborted fetuses; and laboratory-acquired infection (generally through aerosolization). Good personal hygiene practices are essential along with the isolation of known cases.

Clostridium tetani (Tetanus)

Tetanus is caused by the bacterium *Clostridium tetani*. Infection is usually caused in humans by the introduction of infectious agents into a wound, usually by an animal bite or scratch. Persons handling animals should consider a tetanus vaccination and handle animals so as to avoid bites and scratches.

Further Information

UNATTENDED EXPERIMENT FORM	Ref: SWPS092	Approved by: FASC Feb 2011
	Assessed by: FASC Feb 2011	Reviewed by FASC June 2017
		Issued by EH: September 2017

Person Exposed to Risk

Students Employees Public Contractors Visitors

Description

This form is to be completed by the individual conducting the experiment and posted at the location of the experiment (and on the door of the laboratory– out of hours).

General**CONTACT DETAILS**

Name of Student: _____

Name of Instructor/Supervisor: _____

Contact Phone Number: _____

DETAILS OF EXPERIMENT

Location of experiment:

Start date: _____

Start time: _____

End date: _____

End time: _____

Personal Protective Equipment that must be used when handling this experiment (gloves, safety

glasses, face shield etc.):

- Gloves
- Coat
- Glasses
- Face Shield
- Other _____

Services required (Tick those that apply):

- Water
- Electricity
- Fume hood
- Compressed gas
- Other _____

Are there any hazards associated with this experiment (if so please explain and attach the relevant risk assessment form):

The above information is correct to the best of my knowledge:

Signature of Investigator

Date

Further Information

DISSECTION / SURGERY	Ref: <i>SWPS093</i>	Approved by: <i>FASC Feb 2011</i>
	Assessed by: <i>FASC Feb 2011</i>	Reviewed by <i>FASC June 2017</i>
		Issued by <i>EH: September 2017</i>

Person Exposed to Risk

Students Employees Public Contractors Visitors

The persons undertaking the works are at highest risk

Description

Dissection and surgery works involving the use of blades and similar equipment is routinely carried out by Biology and Veterinary students. Persons engaged in such activities run the risk of being cut by blades and or being exposed to infectious or parasitic agents. Also chemicals (e.g. formalin) in the case of preserved specimens.

General

1. Persons engaged in dissections and surgical operations must observe excellent personal hygiene practices. To this end all persons must:
 - Cleanse or wash their hands after dissections and surgery and prior to leaving their workplace or using the telephone, computer or any other equipment
 - Not insert their hands or fingers or any pieces of equipment e.g. pens, into their mouth / eye / nose / ears whilst engaged in dissections or surgery
 - Cover all cuts, abrasion and skin lesions with a waterproof dressing at all times
 - Ensure that protective clothing (i.e. lab coat or scrub uniform) is worn when engaged in dissections or surgery and is removed before leaving the working area and is laundered on a regular basis
 - Ensure that gloves are worn when engaged in dissections or surgery
 - Ensure that no food or drink is consumed in the working area
 - Specimens and cadavers that are not preserved should be stored in a freezer for at least 7 days prior to dissection to ensure that no live parasites are present.
 - If parasites are found to be present, the practical class should be immediately terminated, the cadaver disposed of and the area treated with a disinfectant or other suitable chemical agent.

2. Good sharps practices must be adhered to at all times:
 - Always handle blades with care

- Use the appropriate blade for the task. Do not use scalpel blades or razor blades unless absolutely necessary and when in use handle them with care
 - Wherever possible use single unit disposable scalpels rather than changing the blades on a re-useable holder
 - If not being disposed, used blades must always be placed in a safe position and orientation so as to avoid possible accidental injury to others. Do not leave scalpels pointing upwards from beakers or similar.
 - Where a blade is used in a holder, particular care must be taken when changing the blade. The blade should not be held in the fingers during the process and the use of excessive force must be avoided.
 - When working at a cadaver / specimen / patient only one person at a time should be holding / working with a blade
 - Always cut away from your body and away from others
 - Do not pass cutting or sharp instruments from hand to hand
 - Do not turn around with cutting equipment in the hand
 - Use round nose scissors whenever possible.
 - Place used sharps directly into a sharps bin for disposal (have a sharps bin available at the point of use to enable immediate disposal). Do not overfill sharps bins; fill only as far as the fill line.
 - Cuts caused by sharps should be treated immediately. Wash well under running water and cover with a dry dressing. Apart from very minor injuries, a First Aider should be called or the student should be brought to the Health Centre. In the event of sustaining an accident resulting in a wound:
 - Immediately wash the wound liberally with water but without scrubbing
 - Gently encourage free bleeding of puncture wounds but do not suck the wound
 - Dry the area and apply a waterproof dressing
 - Seek medical advice if the sharp concerned was contaminated with any hazardous materials
 - There is no evidence available to show that using antiseptics or squeezing a wound will reduce the risk of transmission of a blood borne pathogen. Using a caustic agent such as bleach to wash a wound is not recommended.
 - Fill out Accident/Incident Report Form and inform Lecturer/Supervisor or Head of Dept.
3. Dissection / surgery tools should be kept clean, sharp and free from rusts.
 4. Clean or dispose of equipment after every dissection / surgery.
 5. Design systems of work so as to eliminate aerosol formation.
 6. Properly mount / position dissection specimens. Do not dissect a specimen while holding it.
 7. Refer to SWPS Zoonoses, Sharps, Laboratory Safety Regulations, Personal Hygiene, and Animal Handling for further information.

Preserved Specimens

1. Avoid contact with preservative chemicals.
2. The use and handling of preservation chemicals may require the completion of a chemical agents risk assessment.
3. Rinse preserved specimens completely before dissection.
4. Wear safety goggles / glasses to prevent the splashing of any preservation chemicals into the eyes.
5. Splashes should be washed thoroughly with running water.
6. Wear gloves and protective clothing.
7. Know where the nearest supply of clean running water and First Aid is located.

Further Information

Biosecurity of Invasive Species within Irish Waterways	Ref: 094	Approved by: <i>FASC May 2016</i>
	Assessed by: FASC May 2016	
		Issued by: EH Sept 2017

Environments Exposed to Risk

Lakes Rivers Sea

Invasive non-native plant and animal species are the second greatest threat to biodiversity worldwide after habitat destruction. They can negatively impact on native species, can transform habitats and threaten whole ecosystems causing serious problems to the environment and the economy.

Description

Follow the below guidelines to help eliminate the spread of invasive non-native species.

This will apply to boats, anchors, field equipment and PPE including waders and wellies. Engines and paddles should also be thoroughly cleaned.

General

- **Inspect – Remove – Dispose – Report:** Removing build-up of plants and animals from equipment and the hull of boats is effective at preventing the opportunity of colonization by invasive species. To prevent the spread of invasive species ensure you always follow these guidelines:
 1. **Clean all parts** of equipment, boats and trailers that come into contact with the water. Remove any visible plant, fish, animal matter and mud.
 2. **Do not allow rinse water to return to the aquatic environment, where possible:** Many organisms can remain viable even in small (sometimes microscopic) quantities.
 3. **Do not move fouled vessels** or equipment from one waterbody to another.
 4. **Keep good records** of equipment and boat's cleaning.

Further Information