

School of Natural & Computing Sciences

Health and Safety Policy for Office-Based Operations

Introduction

Health and Safety is of vital importance to the School of Natural & Computing Sciences. We wish to prevent our activities causing harm to staff, students or members of the wider community. Not only can accidents cause pain and suffering, they can also use up resources that could be put to better use. It is, however, important that we ensure that the measures taken match up to the risk, so that procedures do not become unnecessarily onerous.

In this document you will find details of what we do in the School to prevent circumstances arising which could cause injury or ill health. It is important that both staff and students understand their role in these arrangements. Health and safety legislation imposes duties on both staff and students as well as on the School and the University as a whole. The co-operation and active involvement of everyone in the School is essential if we are to meet all our statutory obligations.

Our systems and procedures can always be improved and anybody who has a suggestion for improvement is strongly encouraged to contact Jan Walker, Technical Resources Officer (TRO) (jan.walker@abdn.ac.uk). A formal review of the safety procedures and arrangements will be undertaken every 12 months.

Professor Jan Skakle
Head of School

May 2016

Health and Safety Organisation in the School

Professor Jan Skakle, as Head of School, has overall responsibility for health and safety in the School.

The Head of School will:

- Provide an effective Health and Safety Policy for the School.
- Ensure the provision of resources necessary to enable the policy to be implemented.
- Commission inspections of the School to monitor whether the School's health and safety arrangements are being complied with.
- Commission reviews (at least one per year) of the effectiveness of the Policy and the arrangements to ensure its implementation.
- Chair the School's Health and Safety Committee

In the School (and throughout the University) health and safety matters are line management responsibilities. Accordingly, individual members of staff are required to take responsibility for health and safety in all activities under their control. Those who manage and supervise other staff and students must ensure that the staff and students are aware of the dangers in the tasks they undertake, understand and are able to implement appropriate precautions. They must ensure that staff and students are provided with appropriate training and supervision.

RISK ASSESSMENT

It is incumbent on every member of staff, academic, technical or administrative, to ensure that they (and those they supervise or manage) are working in a safe environment and adopting sensible working practices in performing their duties. To this end staff should carry out regular risk assessments, whether these be informal and unrecorded or by the more formal documented procedures (outlined below), to maintain safe working practices and implement control of hazards.

It is important that staff, whether supervising students or not, should not lose sight of the purpose of the risk assessment. Its purpose is not to produce a completed "form" which then can be placed on one side and forgotten about. It is to reduce the potential for injury in the laboratory and in the field. The work should be discussed in sufficient detail and enough committed to writing to achieve this purpose.

Risk assessment is the process of identifying where there is a significant risk (i.e. danger) in an activity and determining how that risk can be reduced to an acceptable level (i.e. working out how the activity can be carried out safely).

The carrying out of risk assessments is fundamental to the effective management of health and safety in the School. If we do not first identify how people might be hurt we cannot then take steps to prevent them being hurt. The School is obliged by law to ensure that risk assessments are carried out. There is also a legal requirement to record the "*significant findings*" of risk assessment in writing. The "*significant findings*" are the precautions which need to be taken when carrying out particular activities. It is the responsibility of all members of staff and students to carry through these processes where appropriate.

A good risk assessment is one which concentrates on the main hazards (and ignores the trivial ones) and records the "significant findings" in a way which will help those involved in the work to carry it out safely.

(This booklet covers the main health and safety hazards present in the School. Those in supervisory positions must ensure that the precautions outlined are implemented in their areas of control. They must also ensure that necessary precautions are developed and implemented for any activities which create dangers not covered by this booklet.)
(See appendix A for Risk Assessment form)

School Safety Coordinator

Jan Walker, Technical Resources Officer, is the Schools Safety Coordinator. The main duties of the School Safety Coordinator is to provide advice to members of the School on health and safety matters and to guide us all in the development and implementation of our health and safety arrangements. Anyone with a health and safety problem which they cannot resolve should not hesitate to contact her. In her absence, follow the out of office statement in her email, or contact the University's Director of Health, Safety and Wellbeing, Mr Naveed Qamar (naveed.qamar@abdn.ac.uk)

Discussion of Health and Safety Matters

Health and safety matters will be discussed and addressed as and when necessary. The School also has a Health & Safety Committee which will meet at least twice a year. In addition, health and safety is also discussed as a standing item on the agenda at each Discipline staff meeting. If any student or member of staff has a health and safety matter which they believe should be discussed at a meeting, they should contact the Safety Coordinator.

Responsibilities of all staff and students

Legislation places responsibilities on organisations to ensure the health and safety of their staff and others who may be affected by their activities. However individuals also have health and safety responsibilities.

- Staff and students must co-operate and comply with the health and safety arrangements put in place by the University and by the School.
- Staff and students must do what they can to make sure that their activities do not cause harm to others.
- Anyone who sees, or becomes aware of, something which they believe is unsafe should either take immediate steps to make it safe or alternatively bring it to the attention of someone who can do something about it.
- No one should interfere with, or misuse, anything which is provided for reasons of health and safety.

Health and Safety Information

This document contains some of the health and safety information which staff and students will need. It will be reviewed at least every 12 months and the booklet will be reissued if any changes are required.

Other health and safety information will be circulated to members of the School and/or posted on the notice boards located at several places in each building occupied by Disciplines within the School.

Fire Safety

Fire is probably the greatest single safety-related threat. Even if everyone were to escape safely from the building, a fire could destroy our facilities and all our documents and data. It is important therefore that we do as much as we can to prevent a fire starting. If despite our best efforts a fire should start, a fast and effective response can help save life and property.

Fire prevention

The University's no smoking policy eliminates one of the main ways in which a fire can start. Our systems for inspecting electrical equipment should reduce the chances of faulty electrical equipment being a source of fire. Other important precautions are:

- Avoid large accumulations of material which might easily burn (e.g. waste paper, cardboard, plastics)
- Do not obstruct the ventilation of electrical equipment or place material immediately above or close to electric heaters.
- Do not overload electrical sockets by connecting too many appliances to a single socket.

On discovering a fire

If you discover a fire, it is important to take the following steps in the order given:

- 1) Sound the alarm (No fire is so small that the alarm does not need to be sounded. A fire extinguisher should not be discharged onto a fire until the alarm has been sounded.)
- 2) Get someone to call the fire brigade by dialling 9-999
- 3) Warn others in the area (Shout fire and bang on doors! Some people do not always respond immediately to fire alarms)
- 4) Only if you can do so without putting your own safety at risk, attempt to fight the fire with a suitable extinguisher
- 5) Otherwise, close the door to the area where the fire is (to contain the fire) and leave the building and await the arrival of the fire brigade.
- 6) At the assembly point (shown on the fire notices) report to the person in charge. Provide them with information about what has happened.

On hearing the fire alarm

If you hear the fire alarm:

- 1) Check the rooms near to yours, if you can, to ensure the occupants have heard the alarm and have left.
- 2) Leave the building by the nearest exit and go to the assembly point shown on the fire notices.
- 3) Anyone teaching or supervising groups of students should ensure that all the students leave the building by the nearest exit and go to the assembly point.
- 4) If you have any information about someone who might be still in the building, report to the person in charge.

Note: Do not re-enter the building until advised to do so and take an active role in also preventing others from re-entering. Call Ext 3939 (24 hour Estates number) to request attendance from an electrician to silence and reset the alarm.

Extinguishers

MEMBERS OF THE SCHOOL INCLUDING VISITORS AND POSTGRADUATE STUDENTS SHOULD MAKE SURE THEY KNOW THE EXACT LOCATION OF ALL FIRE EXTINGUISHERS AND HAVE READ THE INSTRUCTIONS.

There are four main types of extinguisher used in the University. The applications for which they are suited are summarised below:

	Water	Foam	Carbon Dioxide	Dry Powder
Wood, paper textiles etc.	✓	✓		✓
Petrol, oil, fats, paints etc.		✓	✓	✓
Electrical hazards			✓	✓

Water must **never** be used on burning liquids or electrical equipment.

All extinguishers are checked every 12 months and the date of last inspection is shown on the extinguisher.

Escape routes

Corridors and escape routes must be kept clear. Combustible materials should not be stored in corridors or on escape routes where they could become a source of fire and smoke.

Furniture and other items should not be placed so they partially block escape routes. Narrowing of escape routes will reduce the rate at which people can leave the building in an emergency. In a corridor filled with smoke, furniture can create a serious obstacle for someone who is trying to find their way out.

Fire doors will help prevent the spread of smoke and fire through a building and make it easier for people to escape. Fire doors should therefore be kept closed and not wedged open.

Fire drills and alarm tests

Fire drills are held once each year to enable us to test the efficiency of our fire evacuation arrangements.

The fire alarm for the Fraser Noble building is tested every week on Wednesday at 10.00hrs. The fire alarm for Meston is tested every Wednesday from 07.30hrs.

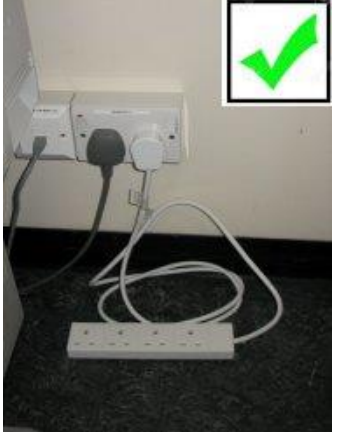
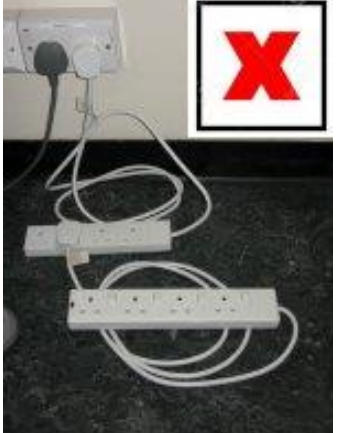


Electrical Safety

Accidents involving electricity are usually very serious. Anyone who comes into contact with a source of electricity and only receives a shock from which they can walk away should consider themselves very lucky. Faulty electrical equipment can also be a source of fire.

- 1) All items of portable electrical equipment will be regularly inspected by a competent person. The inspection programme will be co-ordinated by Jan Walker.
- 2) If you have any reason to believe that any portable equipment is damaged or defective, you should
 - (i) Unplug the equipment.
 - (ii) Take steps to prevent anyone plugging it in again (e.g. tape a warning sign over the plug or cut it off)
 - (iii) Inform Jan Walker who will arrange to have it repaired by a competent person.
- 3) Regularly look at the condition of electrical equipment which you use. If you see anything that looks unsafe (e.g. a cracked plug, frayed wire, broken insulation) report it immediately so steps can be taken to have it repaired. Repairs may only be performed by a competent person AND BY NO ONE ELSE.
- 4) Electrical equipment, apart from new equipment, should never be used in the School without first being inspected and passed by a competent person. In particular items such as electric kettles and heaters brought from home should not be used until they have been inspected. Contact Jan Walker to arrange inspection of any equipment.

Please note that as of 13 January 2015, the use of daisy chained mains extensions leads are prohibited block adaptors are also prohibited.

Examples of correct and incorrect arrangements.

<p>Correct:</p> <ul style="list-style-type: none">• Only one extension is plugged into a socket outlet.	
<p>Incorrect:</p> <ul style="list-style-type: none">• One extension is plugged into another.• Daisy chaining is prohibited by the University.	
<p>Incorrect:</p> <ul style="list-style-type: none">• One extension is plugged into another and trailing across the floor.• Daisy chaining is prohibited by the University. Pathways should be kept clear of trip hazards.	
<p>Incorrect:</p> <ul style="list-style-type: none">• Block adapters are prohibited by the University as they can introduce overloading or overheating.	

Housekeeping

Everyone can make an important contribution to safety by keeping our environment in a tidy condition

- Keep passageways and the area around where you work clear for access. People can be injured bumping into or tripping over items. In event of fire clear access to the fire exits will be needed.
- Keep cupboards and filing cabinet drawers closed. They can cause injury if left open and someone bumps into them.
- Never allow wires and cables to pass across places where people might walk. They can be a serious trip hazard. If there is no alternative route ensure that a cable is covered by special rubber cable protectors designed for this purpose.
- Do not let rubbish accumulate other than in rubbish bins. Any accumulation of material which can burn increases the risk of fire.
- Keep any drink and food preparation areas clean and tidy. As well as looking unsightly, dirt in such areas can be a hazard to health.

If you see a spillage on the floor that has been made by someone else, arrange for it to be cleaned up immediately before someone slips on it and injures themselves.

Building Maintenance

The Estates Section is responsible for maintaining the fabric of University Buildings and any fixtures and fittings. Buildings are regularly inspected by staff from the Estates Section. However those who work in a building are likely to be the first ones to notice that something is unsafe. Any building items requiring attention should be reported to Jan Walker who will arrange for Estates Section to be contacted. Any matters requiring urgent attention should be reported immediately directly to Estates using the emergency 24 hour number - extension 3939.

Non-emergencies can be reported online via the estates fault line at <http://www.abdn.ac.uk/staffnet/working-here/fault-reporting-789.php>

Access to Heights

Every year several people in the University are injured after falling while using an unsuitable means of access to reach storage above head height. The “unsuitable means of access” is usually a chair. The only suitable means of access are a step ladder or a “kick stool”. Chairs (and particularly swivel chairs) should never be used.

When storing items on shelves do not place heavy items up high. They will be difficult to place on/remove from the shelves and if they were to fall they could badly injure someone. Instead place them at waist height or closer to the floor.

If you require a kick stool for regular access to shelves, please contact the School Office they keep some in stock.

Manual Handling

Even in an office, back injury resulting from manual handling is a common cause of lost time accidents. Injury to the lower back, caused by a momentary lapse of good practice, may never recover fully and can be prone to relapse.

It is not only injuries to the back which can result from manual handling operations. Cuts, bruising of hands and feet are injuries which can occur when manual handling is not done correctly.

Before attempting to lift anything, size up the job. Do not hesitate to seek help with heavy or awkwardly shaped loads. Always look at the possibility of moving the load in an easier way (e.g. by using a trolley or some other form of mechanical assistance).

Anyone with any doubts about their ability to lift or carry a particular item, discuss it with their immediate supervisor. It will usually be possible to work out a different way to move the item.

Members of the School with supervisory responsibilities should ensure that people under their control are not expected to carry out manual handling operations which are likely to cause injuries.

Computer Workstations

Those working with keyboards and computer display screens for prolonged periods as a significant part of their normal work can be exposed to a number of health hazards. The principal hazard relates to the arms. The problems which can develop are referred to as WRULDs (Work related upper limb disorders). The risks can readily be controlled by applying ergonomic principles to the design, selection and installation of computer equipment, the design of the workplace, and the organisation of the task.

The risk is only significant for those who use computer workstations intensively for a large part of each working day. Staff who are identified as being in this category will have their workstations assessed for compliance with workstation standards. They will also receive instruction on how to use their workstations correctly.

Workstation assessors for the School will carry out the assessments.

Stairs

When using stairs, please hold the hand-rail where possible. Report any hazards or obstructions on the stairs immediately to the TRO.

Chemicals

There are no chemicals used in office-based operations which require special precautions. The following points should however be noted.

- Photocopiers/MFDs can generate small quantities of hazardous gases. However photocopiers/MFDs in the School are located in well ventilated areas and do not present a problem.
- The cleaners who work in the building use specialised cleaning chemicals. These chemicals are to be used only by the cleaners and not by staff or students in the School. (Similarly, none of the specialised cleaning equipment is to be used by anyone other than the cleaners who have been trained in its operation.)

Out-of-Hours Working

A swipe card entry system is installed for out of hours access to the Meston Building. All PhD students and staff will be able to enter using your ID card.

If UG students are required to enter the building after 7pm, the Head of Discipline must be informed and the information passed on to Ms Julie Timms or Mrs Lynn Harrison. (julie.timms@abdn.ac.uk , l.harrison@abdn.ac.uk).

There are two out of hours entrances to the Meston building.

- The north entrance in evenings is the entrance towards Meston 1, (the petrophysics lab corridor) beside the library
- The south entrance is the usual one on Meston Walk.

You will still be required to sign in after 8pm. Those doing chemistry lab work must sign in at the south entrance for “out of hours” work.

If you have problems with your swipe card, you can report this to servicedesk@abdn.ac.uk and check through the MyIT portal: <http://www.abdn.ac.uk/staffnet/working-here/it-support.php>

There is no need for sign in to the Fraser Noble building as the swipe entry system there both controls and maintains records which can be interrogated.

Be aware that using lifts during out-of-hours periods may result in a long wait for rescue in the event of a breakdown.

Please also consider the University Lone Working policy, which can be found at: http://www.abdn.ac.uk/safety/resources/personal/lone_working/

New Staff

Staff who are new to the School will receive training in our health and safety procedures. This training should normally be staggered over the first few days in post, with some essential training being given on day one. An individual’s immediate supervisor is responsible for ensuring that the training is given.

First Aid

Lists of qualified first aiders and first aid supplies are posted on notice boards around the buildings. There is also a First Aid room in Meston 037 and one in Fraser Noble 068.

Accidents and Near Misses

Staff and students should report accidents as soon as possible to their immediate supervisor. The following must be reported:

- Any incident in which anyone is hurt (regardless of how minor the injury might appear at the time and regardless of whether they need medical treatment)
- Any incident in which someone could have been hurt (but in which perhaps chance or “good luck” prevented injury). These incidents are sometimes referred to as near-misses.

There are several reasons for reporting accidents. The most important is to enable us to take action to prevent a similar accident happening in the future (perhaps with more severe consequences). We may also need to report the incident to the Health and Safety Executive or to our insurers.

A University accident report form should be submitted whenever there is an accident or a near miss. The form can either be completed online or, alternatively, copies of the form can be downloaded, printed and then completed by hand:
<http://www.abdn.ac.uk/safety/general/accidents/>

The report should be completed and submitted by the immediate supervisor of the injured person or by the person in charge of the area where the accident happened. **THE FORM SHOULD NOT BE COMPLETED BY THE INJURED PERSON.**

The completed form should be submitted within 48 hours of the accident. Serious accidents should be reported to the University Safety Advisers immediately by telephone (ext 3894 or 3896) or as an on-line report. (As a rule of thumb, an accident is "serious" if the injured person has gone to hospital as a result of the accident.) Please do not delay submitting the report because you want to make sure that you have gathered all the facts surrounding the accident. A second report can always be made at a later date with any additional information.

The University Safety Advisers will ensure that necessary reports are submitted to the Health and Safety Executive and that serious accidents are reported to the HSE immediately by telephone.

The local Safety Adviser should be informed of an accident as soon as possible and, where necessary, asked to assist with the investigation.

Inspections

Health and safety inspections are carried out to help us evaluate whether the School's health and safety arrangements are working in the manner intended. Inspections will take place at least once each year and will be carried out by a team led by Jan Walker. The inspection team will report to the Head of School with its findings.

Waste

None of the waste generated by the office-based operations within the School should, under normal conditions, be hazardous. There may sometimes however be materials or items which could present a risk to those who have to remove and dispose of our waste (e.g. chemicals, sharp blades). Nothing which is potentially dangerous should be put in normal waste bins. Instead contact Jan Walker for advice.

(See Appendix B for waste procedure)

Insurance

When travelling abroad, please ensure you have completed an insurance form as this will provide you with full cover. This can be found at:

<http://www.abdn.ac.uk/staffnet/working-here/travel-372.php>

Driving on University Business

Guidance on Driving on University Business has been prepared at the request of the University Health and Safety Committee. This can be linked from: <http://www.abdn.ac.uk/safety/resources/equipment/vehicles>

Stress

The University is committed to providing a healthy and safe working environment for all staff and recognises that excessive levels of work-related stress are a potential cause of ill-health.

In the first instance a member of staff who feels they may be suffering from stress should speak to either:

- Head of School/Section
- Human Resources Officer
- Occupational Health Service
- GP
- Counselling Service
- Trade Union Representative

The University has a duty in law to ensure that the health of its employees is not adversely affected by their work. This policy and associated guidance set out what the University does to manage work-related stress.

The full policy can be found at: <http://www.abdn.ac.uk/staffnet/working-here/stress-management-988.php>

CoPS WASTE DISPOSAL

Nearly all processes in the College will generate waste of some sort. Some of the waste will be hazardous in nature. We have a duty to ensure that hazardous waste **does not harm anyone likely to handle it**. This includes those who:

- handle it between the point where it is generated and the point of ultimate disposal (e.g. cleaners, porters, waste disposal contractors)
- come into contact with the waste at its point of ultimate disposal (e.g. chemicals mistakenly sent to a landfill site for domestic waste. This could harm workers at the site, or children/families who might play or live near the site).

We separate waste into separate “waste streams” at the point of generation. Each waste stream is stored separately and goes through a separate route to separate points of ultimate disposal.

The safe disposal of any kind of waste is only possible when the nature of the waste is known. All materials must be kept in labelled containers at all times.

It is essential that research students and other personnel arrange for the disposal of all chemicals in their charge before they leave the College. Supervisors must accept responsibility for this.

Never allow waste to accumulate over long periods of time.

Everyone must:

Be aware of the different waste streams which go out from the School ensure they know into which stream all the different types of waste which they generate must go know where in the Buildings to place waste for each of the waste streams.

The waste streams that go out from buildings are:

A. Solid waste

Laboratory Waste - Chemical contaminated waste e.g. gloves, lab plastics.

Responsibility – Supervisors, Laboratory Coordinators or Technician-in-charge

- waste goes into **orange** bags.
- each lab disposes of bags into **yellow** bin in cage in the Meston quad. The key is held in Chemistry Store.

Sharps and Biohazard contaminated sharps – needles, syringes, scalpel blades

- waste goes into Sharps bin (yellow with red lid).
- when bin is full, close it (it seals shut, and can't be reopened) and take it to the Chemistry Store.
- disposal is arranged by environment Office.

Asbestos

Can only be uplifted by specialist companies, contact TRO in first instance.

Biohazardous waste - Bacterial plates, tissue culture, plastic, plant material

- autoclaved waste goes into **orange** bags.
- each lab disposes of bags into **yellow** bin in cage in the quad. The key is held in Chemistry Store.
- disposal is arranged through Environment Office.

Radioactive waste (STRICTLY CONTROLLED)

- Keep in allocated radiation controlled area and contact Radiation Protection Supervisor. Radioactive waste requires special procedures; advice is provided to the University by NHS Grampian Radiation Protection Service. In first instance contact Local Safety Coordinator.

University radiation protection adviser - Dr Stephen McCallum, .mccallum@abdn.ac.uk

Geosciences local radiation supervisor - Dr Steve Bowden, s.a.bowden@abdn.ac.uk

Chemistry local radiation supervisor - Dr William Harrison, w.harrison@abdn.ac.uk

Broken glass, uncontaminated glass Pasteur pipettes

- uncontaminated glass should be placed in puncture-proof container. Full containers should be sealed and labelled as broken glass and disposed of in main bins.

Equipment and metal

- Twice yearly uplift of electrical equipment for disposal (WEEE). All equipment must be certified as decontaminated (forms available from TRO), all hazard labels removed and labels detached.
- Metal must not be disposed of in black bags, autoclave bags or orange bags. There is a metal waste skip behind Fraser Noble, contact TRO for advice.
- Computers and peripherals, disposal arranged through IT services, servicedesk@abdn.ac.uk

General non-hazardous, inert contamination, domestic waste e.g. paper towels

- waste goes into **black** bags.
- it is disposed of in land fill sites.
- **cleaners** will take this waste away.

Recycling

Confidential waste and waste paper, e.g. newspapers

- waste goes into the SHRED-IT consoles located around the building
- SHRED-IT empty these consoles weekly, if you have a large amount from an office clear out then do not use this console use white SHRED-IT bags instead available from the Environment Office - environment@abdn.ac.uk

Cans, Plastic and glass bottles - into **green bins** in various locations around buildings.

Cardboard – MESTON

Remove all plastic (this is deemed general waste and should be disposed of in normal bins), flatten and take to loading bay.

– ST MARYS

Remove all plastic (this is deemed general waste and should be disposed of in normal bins), flatten and take to kitchen area.

– FRASER NOBLE

Remove all plastic (this is deemed general waste and should be disposed of in normal bins), flatten and take to cage in corridor.

B. Liquid waste

DISPOSAL OF SOLVENTS

Solvent waste should be kept in clearly labelled bottles. Each solvent in the waste must be listed. When full, these should be taken immediately to the Waste Solvent Store (metal cabinet in Loading Bay 2), which is cleared daily. **Waste solvent bottles must not be left tightly stoppered, a vented cap can be picked up from the Chemistry Store.**

Important note:

Never mix chlorinated (e.g. chloroform, trichloroethylene) and non-chlorinated (e.g. acetone, diethyl ether) liquids. This is a condition of the university's contract with the firm which collects and disposes of this waste.

Persons drying solvents with sodium wire have the responsibility of (a) attaching warning labels to bottles containing such solvents and (b) disposing of the sodium wire as follows: *Sodium wire can be safely quenched by first adding to the bottle sufficient propan-2-ol to cover the wire. Leave in a fume cupboard until no more evolution of gas is visible. Slowly add small portions of methylated spirits until all the sodium has completely dissolved.*

Many chemicals can be safely disposed of down drains using copious amounts of water, but note this is only acceptable if explicitly stated in the MSDS.

Before purchasing chemicals consider how it will be disposed of.

Significant quantities of unwanted chemicals should not be allowed to accumulate.

If you have unwanted chemicals that cannot be discharged to the drains, contact Local Safety Coordinator. Where possible, dangerous wastes should be rendered innocuous by suitable chemical treatment.

WASTE CHEMICALS / SOLVENTS

Twice yearly uplift of chemical waste, by external contracted company, is arranged through the University Environment Office with liaison through TRO's.

Autoclaves

These are often used to treat waste from biological laboratories. It is well established that a cycle of 121^o C for 20 minutes is sufficient to render most materials sterile. It is important however to ensure that all parts of the load are raised to the required temperature for the required time. The timing of the cycle should commence only when all parts of the load have achieved the required temperature. It can take a considerable time for the centre of some loads to achieve the same temperature as the outside of the load.

If you use autoclaving as a means of treating biological waste to make it sterile how do you know that the waste is subjected to the required temperature for the required time?

Internal temperature probes

If the autoclave has an internal "wandering" temperature probe which can be placed in the centre of the load you can programme the autoclave to time the cycle from the moment the probe indicates that the centre of the load is at the required temperature. If possible the load probe should be connected to a chart recorder so that a record of each cycle can be created and retained. You should check that the internal probe is reading the correct temperature by comparing the readings with those of independent calibrated thermocouples placed alongside the internal probe during the annual testing and service of the autoclave.

Alternative methods

If the autoclave does not have an internal temperature probe that can be placed inside the load there should be an alternative means of ensuring that waste is subjected to the required temperature for the required time. At annual service thermocouples should be placed inside a worst-case load and the time taken for all parts of the load to reach the required temperature recorded. (This service is provided by external contractors). **In addition the first load of waste each week should have an autoclave indicator strip placed in the centre of the load.** Records should be kept. The strip will change colour if the strip (and therefore the load) is subjected to the required temperature for the required time. Indicator strips are inexpensive and can be obtained for various temperatures and exposure periods. It is important to select the correct type of strip.

Additional information

Autoclave tape indicates only that the required temperature was reached, not that it was held for the required time. Autoclave tape does not therefore demonstrate that the load was subjected to the required conditions. Tape can be useful however to identify material which has been placed in the autoclave and differentiate it from material which is waiting to be autoclaved

Any questions can be directed to the Local Safety Coordinators

*Chemistry: **Dr Rainer Ebel***

*Computing Science, Mathematics, Physics and Geosciences: **Jan Walker***

*Engineering: **Grant Cordiner***

CoPS Waste Streams

