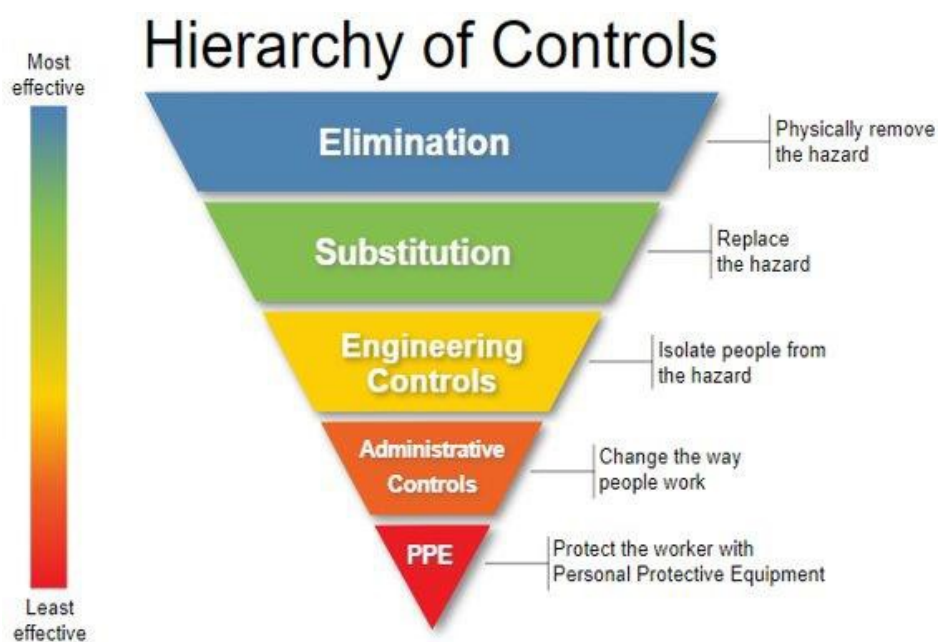


GUIDANCE FOR IMPLEMENTATION OF COSHH - CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 2002



Version	Section(s)	Date	Change details
1.0	All	Jan 2022	Complete reformat from previous document replaces version SPG 23-09 v2, 2011.
1.1	7.2 (2.1, 2.2, 2.4) 7.4	Jan 2023	Minor version update, further clarification added for Health Hazard Statements, assigning Severity rating and updated Risk assessment matrix. Extra guidance for use of control measures on template, Guide to using local exhaust ventilation (LEV) and Respiratory protective equipment at work.

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1 PURPOSE

The University of Sussex uses a variety of substances within its estates, facilities, teaching and research activities. Some of these substances have harmful or hazardous properties and may pose a risk to human health or harm the environment. This guidance details the management arrangements and responsibilities for control of hazardous substances used at or by the University of Sussex.

This guidance document has been prepared to provide managers, supervisors, employees, students and visitors with sufficient knowledge to comply with the Control of Substances Hazardous to Health Regulations 2002 (COSHH). This Regulation covers use of chemicals or other substances at work that can put people's health at risk, and the law requires the University to control exposure to such hazardous substances to prevent ill health. It is not intended that this guidance be applied for simple processes that use proprietary products, for example cleaning products used in building maintenance activities or offices.

The objectives of this guidance are to:

- Reduce to as low a level as reasonably practicable the extent to which staff, students and others are exposed to hazardous substances;
- Ensure compliance with legislation and security requirements in the use of and disposal of hazardous substances;
- Ensure that suitable and sufficient risk assessments are undertaken.

This guidance shall apply to all work* involving hazardous substances which gives rise to a risk of ill health or harm to the environment.

* *Work means handling, use, transportation, storage and disposal of hazardous substances*

2 INTRODUCTION

[The COSHH Regulations](#) deal with hazards to health. The ultimate outcome of the risk assessment will be the production of a Standard Operating Procedure (SOP) which contains step by step instructions for the process with safety control measures included at relevant points in the procedure. Compliance with the requirements of the SOP should then effectively manage the risk.

This guidance can also be supplemented by reference to various guidance documents held on the Health and Safety Executive (HSE) website, www.hse.gov.uk/coshh/index.htm.

The need to make assessments of hazards and risks to health will normally be a component of all the main risk assessments covering all aspects of work within the University.

COSHH defines hazardous substances and preparations supplied for use at work as:

- Substances officially classified as toxic, harmful, irritant or corrosive. Substances should carry the appropriate GHS hazard pictograms on the container, although some proprietary or imported substances may not;
 - Substances with workplace exposure limits;
 - Dusts of any kind in substantial concentrations;
 - Gases and vapours which when present at high concentrations act as simple asphyxiates. Some of these are extremely flammable and should be considered under both COSHH and DSEAR). Where substances are both directly hazardous to health and fall under DSEAR, employers have duties under both these regulations to protect employees;
 - Any other substances that creates a risk to health, e.g. pesticides, allergens;
 - In addition, the COSHH regulations also include hazards arising from work activity, e.g. wood dust, grain dust and foundry fumes;
 - Biological agents* (harmful micro-organisms are assessed in separate template(s)).
- COSHH applies to two broad categories of exposure to biological agent which may be distinguished

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as:

- exposure resulting from deliberate intention to work with a biological agent;
- exposure which arises out of the work but is incidental to it e.g. food production or disposal.

Genetically Modified Cells or Organisms

See guidance on work with Genetically Modified Cells or Organisms (GMOs): [HS G002 Genetic Modification \[PDF 196KB\]](#) and [HS F018 Genetic Modification Risk Assessment Template \[DOC 86KB\]](#).

Biological Agents

Prior to working with biological agents in Group 2, 3 or 4 approval for your project must be approved by the Biological Safety Advisory Group.

Submit a [HS F032 Bioagent risk assessment form \[DOC 75KB\]](#) to your School Biological Safety Officer.

For more information please contact either your School Biological Safety Officer or the Health & Safety Team.

Guidance notes are provided below on the following topics:

- Disinfection: [HS G028 Disinfection \[PDF\]](#)
- Emergency Spill Procedures: [HS G030 Emergency spillage procedures \[PDF\]](#)
- Biological Safety Cabinets: [HS G059 Ducted Local Exhaust Ventilation Procedure \[PDF\]](#)
[HS G060 Recirculating Fume Hoods \(Ductless\) LEV Procedure](#)
- Personal Protective Equipment: [SPG-16-09 Personal Protective Equipment](#)

2.1 What does the law require when working with substances hazardous to health?

- Assessment of risks - identify the hazards from manufacturer's safety data sheets, detailed information on the container/packaging or other sources e.g. literature;
- Identification and implementation of the precautions needed to prevent or control exposure;
- Making sure that staff work in accordance with the safe working procedures and maintaining any equipment used to control exposure;
- Informing, instructing and training staff in control measures and emergency procedures;
- Monitoring that the system of control is working properly and the maintenance of any such systems.

2.2 Chemical risk assessment video

This short video provides an overview of why conducting a risk assessment of laboratory work is so important for maintaining situational awareness as laboratory work proceeds.



Resource: [Lab risk assessment video](#)

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3 RESPONSIBILITIES

Legal duties under COSHH are primarily on Managers, where hazardous substances are used. There must be systems in place for risk assessments to be undertaken for staff, students, visitors and contractors.

3.1 Line managers and supervisors' responsibilities

The responsibility for ensuring a risk assessment is undertaken lies with the Principal Investigator/Senior Scientist/Divisional Manager and although they may not undertake the assessment, they are responsible for ensuring it is suitable and sufficient and must be approved by them. The approval of risk assessment may be delegated to a suitably competent individual e.g. senior member of technical staff/ senior post doc or local safety officer, however the responsibility for ensuring there are suitable and sufficient risk assessments cannot be delegated.

- Identify hazards associated with work activities undertaken by staff and students;
- Perform risk assessments to eliminate any hazards, or where this is not possible, controlling these hazards. This will include providing any personal protective equipment (PPE) identified as being necessary;
- Provide information, training and where appropriate supervision, to staff, students and visitors or outside contractors on how to deal with hazardous substances they may encounter in the course of their work or study within the University;
- PPE is used as instructed, is maintained in good condition (including the provision of appropriate storage) and replaced when damaged.

3.2 Employees responsibilities

Employees should be made aware of the content of the assessment and must be trained in the procedure against the SOP and deemed competent. They are then responsible for ensuring they follow the procedure and apply all control measures specified, including:

- Follow safe systems of work;
- Read and abide by all COSHH assessments, information posters and signs as displayed and to use all hazardous substances safely and in accordance with instructions given;
- Ensure that warning labels are not removed from any container holding any hazardous substance.
- Inform the Management of any situation that they consider may lead to a serious and immediate danger to health or safety, or of any shortcomings they may find in the arrangements for COSHH;
- Use all PPE provided as instructed, store correctly and report any failure in this equipment.

Students or visitors have no specific duties under COSHH but they must comply with the general health and safety requirements such as wearing gloves, masks etc. provided and not misusing anything provided in the interests of health, safety or welfare.

4 ACTIONS REQUIRED TO COMPLY WITH THE REGULATIONS

Hazard and Risk Assessments

Although compliance with the COSHH Regulations only requires assessment to consider hazards to health from the use of substances, it is important to remember that any hazard/risk assessment is only a part of the assessment required for the particular process as a whole.

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What is required:

Step 1	Assess the hazards and the risks
Step 2	Decide what precautions are needed to prevent or adequately control exposure and record
Step 3	Implement control measures to prevent or adequately control exposure
Step 4	Ensure that control measures are used and maintained
Step 5	Monitor exposure and carry out health surveillance
Step 6	Prepare plans for accidents, incidents and emergencies
Step 7	Ensure individuals are properly informed, trained and supervised
Step 8	Review assessments

If you can't prevent exposure, you need to control it adequately by applying the [principles of good control practice](#).

Control is adequate when the risk of harm is '**as low as is reasonably practicable**'.

Principles of Good Control Practice means the application of **eight generic principles** to obtain effective and reliable control of exposure to hazardous substances once the duty to prevent exposure has been considered. The eight principles are defined in COSHH Regulation 7(7) and Schedule 2A as follows:

1) Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health.
2) Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures.
3) Control exposure by measures that are proportionate to the health risk.
4) Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.
5) Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment (final control option) .
6) Check and review regularly all elements of control measures for their continuing effectiveness .
7) Inform and train all employees on the hazards and risks from the substances with which they work, and the use of control measures developed to minimise the risks.
8) Ensure that the introduction of control measures does not increase the overall risk to health and safety.

4.1 Step 1: Assess the Hazards

Identify the hazardous substances present in your workplace and consider the risks these substances present to people's health. Determine who might be exposed and how e.g. can the substance be breathed in, swallowed e.g. by putting contaminated fingers in the mouth or absorbed through skin. The assessment should also cover any risks arising out of cleaning, storage, disposal and maintenance of contaminated equipment.

You must also consider who may be put at risk by the hazardous substances in use, this may not only be the researcher/worker using the substance but cleaners, maintenance staff, visitors and other researchers in the area not directly associated with the process.

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The hazards of substances are usually stated briefly on the container, they are also stated on the supplier's hazard data sheet or Manufacturers Safety Data Sheet (MSDS). For rarer chemical substances not given an official classification or for by-products of the process being undertaken, it is the researcher's responsibility to find out what the hazards are or, where they are unclear, work out the likely hazards by analogy with other substances.

COSHH states you have to assess every **USE** of every substance hazardous to health. Getting the suppliers' data sheet is not enough (although it's a good start). You have to look at the actual **use** of the substance particularly as substances may cross react.

In considering whether a substance is hazardous to health the following additional factors should be considered:

(a)	Different forms of the same substance may present different hazards, e.g. a solid may present negligible hazard but, when ground into dust of a respirable size, may be very hazardous.
(b)	Many substances contain impurities which could present a greater hazard than the substance they contaminate, e.g. crystalline silica is often present in minerals which would otherwise present little or no hazard.
(c)	Some substances have a fibrous form which may present a potentially serious hazard to health, if the fibres are of a certain size or shape, e.g. asbestos.
(d)	Some substances may be known to cause ill health, but the causative agent may not have been identified, e.g. certain textile dusts causing byssinosis.
(e)	Combined or sequential exposures to various substances may have additive or synergistic effects.
(f)	Epidemiological or other data which indicate that a biological agent that does not already appear in the Approved Classification is nevertheless the cause of a hazard to health at work.
(g)	One off, emergency situations arising from the work activity, such as a dangerous chemical reaction or fire which could foreseeably produce a different substance or different form of the substance which is hazardous to health.

An assessment should be made for each research project or for each major component of a research project. The preparation of the assessment document may be undertaken by the member of faculty supervising the work or by their research student or technician. In the case of assessments undertaken by postgraduate students or technicians, the assessment must be checked and approved in writing by the member of faculty supervising the work.

When specifying the safe procedures to be followed, it is acceptable to quote methods cited in the literature provided that, if necessary, some further notes are added to make research students or technicians fully aware of potential risks, e.g. risk of death from inhalation, risk of explosion/fire. The note must also describe the precautions which are required to minimise the risks to health.

Completed copies of project assessment forms must be sent to the School Safety Advisor before the work is started. A copy must be available at the place of work, e.g. in a Hazard and Risk Assessment file or COSHH Assessment file within the laboratory or work area.

Employees should have easy access to COSHH assessments for the substances they are likely to use. In addition to electronic files that are easily accessed, these may be provided in lever arch 'COSHH files' in the work areas or provided as a COSHH file issued to each employee. It is important, managers and supervisors go through these COSHH assessments verbally to ensure that employees fully understand the hazards and risks to health, as well as the work procedures to be followed to control or eliminate exposures.

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4.2 Step 2: Decide what precautions are needed

Identify all relevant **routes of exposure** for inhalation, skin absorption and ingestion when developing control measures. If you identify significant risks, decide on the action you need to take to remove or reduce them to acceptable levels. Consider what precautions represent good practice, designed to achieve adequate control (see Step 3).

Precautions at all stages have to be considered – storage, usage and disposal, as well as risks to all potentially exposed workers – e.g. cleaners and maintenance staff. Be prepared for spillage or emergencies.

4.3 Step 3: Prevent or adequately control exposure

COSHH assessments are not a paper exercise – the purpose of any COSHH assessment is to ensure that the right precautions are identified and implemented. The COSHH Regulations require you to prevent exposure to substances hazardous to health, if it is reasonably practicable. This is always the first consideration. You might:

- Change the process so that the hazardous substance is not needed or generated;
- Replace it with a safer alternative;
- Use it in a safer form, e.g. pellets instead of powder.

If prevention is not reasonably practicable you must adequately control exposure.

“Adequate control” is achieved by applying the eight principles of good practice:

(a)	Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health. Always keep the quantities of hazardous substances in use to the minimum necessary to achieve the required result.
(b)	Take into account all relevant routes of exposure- inhalation, skin absorption and ingestion – when developing control measures.
(c)	Control exposure by measures that are proportionate to the health risk. This could be as minimal as replacing lids on containers.
(d)	Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.
(e)	Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment.
(f)	Check and review regularly all elements of control measures for their continuing effectiveness.
(g)	Inform and train all employees on the hazards and risks from the substances with which they work and the use of control measures developed to minimise the risks.
(h)	Ensure that the introduction of control measures does not increase the overall risk to health and safety.

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4.4 Step 4: Ensure that control measures are used and maintained

Supervisors should monitor that all work is properly assessed and that the controls assessed as necessary are implemented. Further, any control measures used, e.g. Local Exhaust Ventilation must be checked to ensure that they are both operational and maintained by an accredited company in line with the relevant British Standards. Guidance notes are provided below:

- Biological Safety Cabinets: [HS G059 Ducted Local Exhaust Ventilation Procedure \[PDF\]](#)
[HS G060 Recirculating Fume Hoods \(Ductless\) LEV Procedure](#)
- Personal Protective Equipment: [SPG-16-09 Personal Protective Equipment](#)

4.5 Step 5: Monitor exposure and carry out health surveillance

It should be recorded on the assessment form if there is a requirement for exposure to substances hazardous to health to be monitored, e.g. by atmospheric sampling. Control measures should normally be sufficiently robust as to ensure a comfortable margin of safety and should not normally require exposure monitoring.

Where control measures successfully reduce exposure to a level which prevents adverse health effects, no health surveillance is needed. An assessment is necessary before any decision with regard to the need for health surveillance; it should identify whether there is any risk of adverse health effects and if so who is at risk. Currently health surveillance is undertaken for work with respiratory sensitisers. For further guidance or support refer to [occupational health information on the HR web pages](#)

4.6 Step 6: Prepare plans for accidents, incidents and emergencies

Users of substances hazardous to health should know what they would do in the event of a foreseeable unplanned incident, e.g. spillages, toxic gas leakage, fire evacuation. Relevant first aid equipment should be available, the correct equipment at hand for dealing with spills and the correct fire extinguishing equipment available etc.

Guidance notes are provided below:

- Emergency Spill Procedures: [HS G030 Emergency spillage procedures \[PDF\]](#)

4.7 Step 7: Ensure individuals are properly informed, trained and supervised

It is a local departmental responsibility to ensure that staff and students are properly trained, i.e. are competent to do work with substances hazardous to health. Individuals should be told how to work safely and why they should work safely. They should be given the necessary information about the individual substances they are working with and should sign the acknowledgement on the assessment form. Supervisors should visit them regularly to check they are working safely. Where appropriate, laboratory workers must be instructed in the correct use of any control measure to be taken, e.g. fume cupboards or microbiological safety cabinets. In addition, some workers may need specialist training, particularly where they may need to use specialised research methods; or work with unfamiliar equipment or techniques, e.g. carrying out distillations or work with potentially explosive chemical reactions.

4.8 Step 8: Review

Assessments should be reviewed every 3 years. However, each assessment should be reviewed either whenever there is evidence to suspect that it is no longer valid or when there is about to be a significant change in the work to which the assessment relates, i.e. the workplace changes, the staff involved change, or the equipment changes.

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5 REFERENCES

Sources of information include:

- The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance, L5 (Sixth edition) <https://www.hse.gov.uk/pubns/priced/L5.pdf>
- Working with substances hazardous to health: A brief guide to COSHH <https://www.hse.gov.uk/pubns/indg136.htm>
- HSE COSHH website: www.hse.gov.uk/coshh/index.htm
- COSHH Essentials <https://www.hse.gov.uk/pubns/guidance/coshh-technical-basis.pdf>
- COSHH e-tool <https://www.hse.gov.uk/coshh/essentials/index.htm>
- Control measures to prevent or limit exposure to hazardous substances <https://www.hse.gov.uk/coshh/basics/control.htm>
- Principles of good control practice <https://www.hse.gov.uk/coshh/detail/goodpractice.htm>
- A short guide to the Personal Protective Equipment at Work Regulations 1992 www.hse.gov.uk/pubns/indg174.pdf
- Clearing the air: A simple guide to buying and using local exhaust ventilation (LEV) www.hse.gov.uk/pubns/indg408.pdf
- EH40/2005 Workplace exposure limits: Containing the list of workplace exposure limits for use with the Control of Substances Hazardous to Health Regulations 2002 www.hse.gov.uk/pubns/books/eh40.htm
- Fire and explosion: A brief guide to DSEAR in the workplace www.hse.gov.uk/pubns/indg370.pdf
- Preventing contact dermatitis at work www.hse.gov.uk/pubns/indg233.pdf
- Read the label: How to find out if chemicals are dangerous www.hse.gov.uk/pubns/indg352.pdf
- Respiratory sensitisers and COSHH: Breathe freely – An employers’ leaflet on preventing occupational asthma www.hse.gov.uk/pubns/indg95.pdf

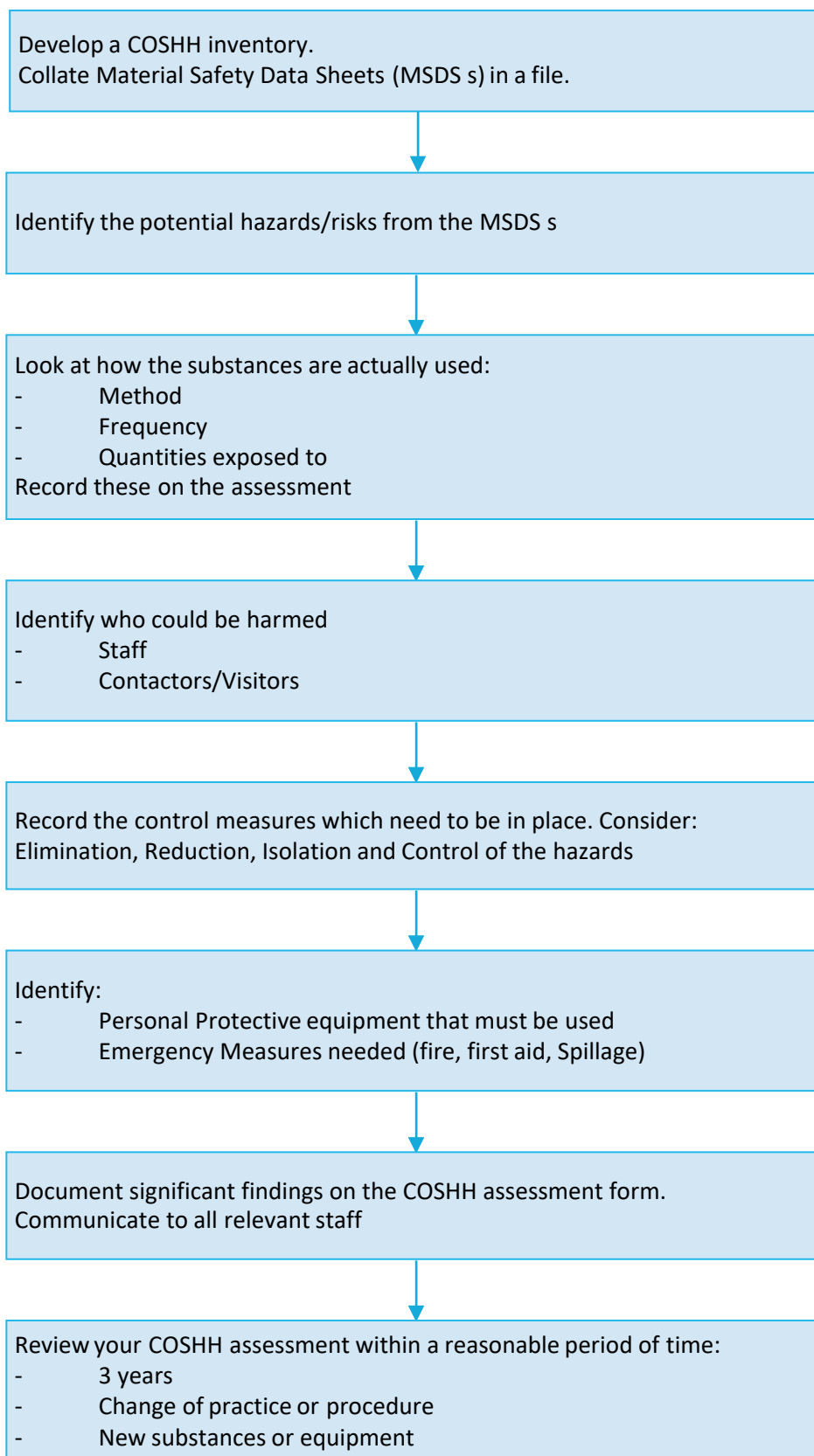
Chemical hazard information (if insufficient detail on safety data sheet)

- ECHA: [Information on chemicals](http://information.on.chemicals)
- Chemical safety data sheets <https://www.hse.gov.uk/coshh/basics/datasheets.htm>

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6 QUICK REFERENCE GUIDE

For quick reference, the guide below is a summary of actions required. This does not negate the need for the document author and others involved in the process to be aware of and follow the detail of this policy.



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7 GUIDANCE FOR COMPLETING A COSHH ASSESSMENT

The [HS F019 COSHH Risk Assessment Template](#) is available from the Health & Safety webpage.

Assessment title of project or activity

Provide the title of the project or activity in this section.

Principal investigator or Responsible person

Provide the name of the principal investigator or the manager who oversees the activity in this section.

School/Department/location(s)/room numbers

Provide the name of your School, Building, Department, Room(s) or details of location for field work.

Date of assessment

Provide the date on which the assessment was carried out.

Date for review

The assessment should be reviewed regularly, at a minimum of every 3 years, and especially if work practices or location change.

7.1 Section 1 – Project or Activity

Description of the work

This should include a summary of the work included under this assessment, specifying the nature of the work. This description should be worded in such a manner as to enable other people and non-experts to understand the exact nature of the work (e.g. workers, safety officers or HSE inspectors).

Identify any specific hazardous operations /steps within the procedure that could increase the likelihood of exposure occurring. For example:

- Vigorous mixing, homogenisation, sonication or shaking of liquids will result in generation of aerosol which could enter the breathing zone;
- Dispensing operations (pipetting, weighing);
- Generation/release of toxic/flammable gases;
- Use of sharps or glassware;
- Working at elevated temperatures;
- Use of naked flames or equipment that generate heat/ spark;
- Operations that result in pressure build up/release;
- Operations that could result in liquid splash;
- Production of hazardous intermediate reaction substances;
- Interactions with other substances.

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7.2 Section 2 – Identify the Hazardous substances (used and generated)

In this section you need to describe the hazardous substances which will be used or to which people could be exposed in the work. Where practicable, non-hazardous, or less hazardous substances must be substituted for hazardous substances. Consider all physical, health and environmental hazards.

Name of Substance (Include all substances used or produced)	Quantity kg / g / ml	Physical Form	GHS Hazard Classification (Tick all that apply)									Severity Rating Refer to Risk Matrix
			 Explosive	 Flammable	 Oxidising	 Compressed Gas	 Corrosive	 Toxic	 Harmful	 Health Hazard	 Environmental Hazard	
1											Choose an item.	
2											Choose an item.	
3											Minor	
4											Moderate	

Identify all chemicals used in the work being assessed and name them in the column labelled substance.

Identify Quantity used

The other risk factor is the amount used for the task. In terms of risk assessment of the actual process this will be the amount dispensed or used in the procedure.

Small amount	Milli-litres	Grams
Medium amount	Litres	Kilograms
Large amount	>1000 litres	> 1Tonne

Consideration of the quantity of supply as this is the maximum amount that could be spilled, and this will determine emergency response in event of a spillage.

Record Physical Form

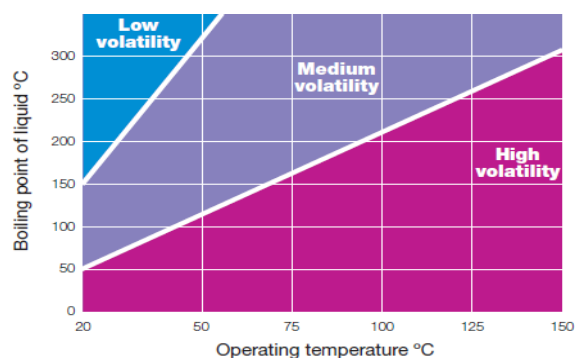
This will influence how a substance can enter the body. Fine dust will be more easily inhaled than substances that are in crystalline form. The physical property for solids is a subjective assessment of the materials dustiness. HSE COSHH essentials uses the following as a guide.

Low dustiness	Pellets which do not easily break up [e.g. NaOH pellets] & non-dusty solids
Medium dustiness	Granular or crystalline and coarse dusts
High dustiness	Fine powders and solids which produce fine dusts.

Gases and vapours will obviously have greater potential for inhalation. Solvents or liquids with high vapour pressure or lower boiling point will more readily give off vapours which can then be inhaled and these are more likely to be absorbed through the skin than aqueous solutions.

The HSE provide the following guidance on assessing volatility on basis of Vapour Pressure and Boiling Point. **Section 9 of the MSDS** gives information on Boiling points and Vapour pressures.

Low volatility liquids	Vapour pressure < 500Pa
Medium volatility	Vapour pressure between 500 and 25000Pa
High volatility	Vapour pressure > 25000Pa



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Record GHS Hazard Classification

Check boxes that indicate the hazards identified within the assessment e.g. if there are flammables used check the flammables box. Refer to the manufacturer's safety data sheets, if insufficient detail on safety data sheet, refer to the European Chemicals Agency (ECHA): [Information on chemicals](#).

There are several sources of information on the hazardous properties of substance which include:

- The label on the container;
- The Manufacturer Safety Data Sheet (MSDS);
- EH40 Workplace Exposure limits (HSE Document).

Labels & Safety Data Sheets

Products may be classed as 'dangerous for supply'. If so, they will have a label that has one or more hazard symbols. When a product is 'dangerous for supply', by law, the supplier must also provide you with a safety data sheet.

Classification, Labelling and Packaging (CLP) of Substances & Mixtures – EU Regulations for a Globally Harmonised System (GHS) came into full effect in 2015, replacing the Chemical Hazard Information & Packaging Regulations (CHIP 4).

Hazard pictograms (symbols)

Hazard symbols and explanation of the hazardous properties of chemicals can be found [here](#).



Hazard (H) statements

For example:	A number designating the type of hazard as follows:
H226 - Flammable liquid and vapor	"2" for physical hazards
H350 - May cause cancer	"3" for health hazards
H401 - Toxic to aquatic life	"4" for environmental hazards

Hazard and precautionary statements can be found [here](#).

Precautionary (P) statements

For example:	A number designating the type of precautionary statement as follows:
P102 - Keep out of reach of children	"1" for general precautionary statements
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.	"2" for prevention precautionary statements
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water	"3" for response precautionary statements
P420 - Store away from other materials.	"4" for storage precautionary statements
P501 - Dispose of contents/container to.....	"5" for disposal precautionary statements

Precautionary statements can be found [here](#).

The following example shows the relevant information for Formaldehyde solution provided by one of the main suppliers of chemicals to the University.

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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flammable liquids (Category 3), H226
 Acute toxicity, Oral (Category 3), H301
 Acute toxicity, Inhalation (Category 2), H330
 Acute toxicity, Dermal (Category 3), H311
 Skin corrosion (Sub-category 1B), H314
 Serious eye damage (Category 1), H318
 Skin sensitization (Category 1), H317
 Germ cell mutagenicity (Category 2), H341
 Carcinogenicity (Category 1B), H350
 Specific target organ toxicity - single exposure (Category 1), Eyes, Central nervous system, H370

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapor.
 H301 + H311 Toxic if swallowed or in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H317 May cause an allergic skin reaction.
 H330 Fatal if inhaled.
 H335 May cause respiratory irritation.
 H341 Suspected of causing genetic defects.
 H350 May cause cancer.
 H370 Causes damage to organs (Eyes, Central nervous system).

Precautionary statement(s)

P202 Do not handle until all safety precautions have been read and understood.
 P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Statements

none

Statements and symbols made under the CLP regulations

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Section 2.1 Assign each substance an inherent severity (hazard) rating




Use the Risk assessment matrix in the template (context: potential harm caused following exposure without controls).

	Minor	Moderate	Significant	Major	Severe
Injury to person(s)	Minimal injury requiring no/minimal first aid. No time off required	Minor injury. First aid required. Less than 3 days off	Moderate injuries. First aid. Attend A&E. Over 7 days off. RIDDOR	Major injury. Professional medical aid. Long-term incapacity. RIDDOR	Death or multiple permanent injuries. RIDDOR
Ill health to person(s) Health Hazard Statement (H)	Minimal/Transitory effects requiring no/minimal intervention H303, H304, H305, H313, H315, H316, H318, H319, H320, H333, H336 and all H-numbers not otherwise listed	Short-term irritation or effects. Occupational health. Less than 3 days off H302, H312, H332, H371	Occupational Health. Over 7 days off. RIDDOR H301, H311, H314, H317, H318, H331, H335, H370, H373	Long-term incapacity but with recovery. RIDDOR H300, H310, H330, H351, H360, H361, H362, H372	Permanent ill health & incapacity. RIDDOR H334, H340, H341, H350
Environmental effect(s)	Minimal or no impact on the environment	Minor impact on the local environment	Moderate impact on the local environment	Major impact on the wider environment	Severe impact on the wider environment

[Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013](#) (RIDDOR) puts duties on employers (the Responsible Person) to report certain serious workplace accidents, occupational diseases and specified dangerous occurrences (near misses). For example, Exposure to carcinogens, mutagens and biological agents. Where, in relation to a person atwork, the responsible person receives a diagnosis of:

- any cancer attributed to an occupational exposure to a known human carcinogen or mutagen (including ionising radiation); or
- any disease attributed to an occupational exposure to a biological agent,

Section 2.2 Special Hazards

2.2: Special Hazards (*Separate risk assessment may be required)							
 Carcinogenic Substance	[ENTER HEALTH HAZARD STATEMENT(S) (H) HERE]			 Biological Material*	[ENTER REFERENCE DETAILS HERE]	 Radioactive Substances*	[[ENTER REFERENCE DETAILS HERE]
Further Details / Other Special Hazards E.g. Dusts or fumes and Asphyxiants: [ENTER DETAILS HERE]							

- Carcinogens, mutagens and teratogens are listed separately, enter Health Hazard Statement(s) (H) here.
- Enter reference of separate risk assessments for Biological materials or Radioactive substances.
- Dusts or fumes which may arise as a consequence of the work should be listed separately.
- Asphyxiants which act by reducing the oxygen content of the atmosphere. These include inert gases, such as nitrogen and argon, but also certain flammable gases, should be listed separately.

Further Details

Identify the risk with each chemical and add as text comment, this information is available in MSDS sheets or on supplier web pages. Use the H and P number descriptors as the preferred method as the assessment should be understandable by all staff/students. Include any incompatibilities as some chemicals cross react this data will be identified within the MSDS.


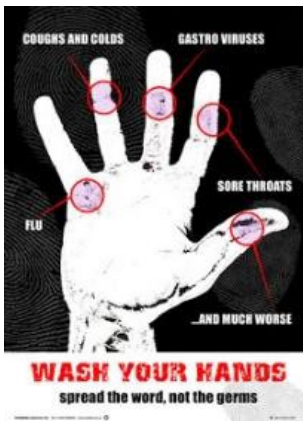



Section 2.3 Exposure routes to Hazardous Substances

2.3: Exposure routes to Hazardous Substances						Workplace Exposure Limits	
Substance	Possible Exposure Route (Please tick)					8h TWA	15min STEL
	Inhalation	Ingestion	Skin	Injection	Other (State)		
1							
2							
<i>Add additional substances as required</i>							

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The potential for hazardous substances to cause ill health will depend upon the manner in which the substance can harm the body (target organs, or systems, at risk), route of entry to the body by which the substance is hazardous (hazard route) and the route of entry which leads to exposure to the substance (exposure route).

Substances may be harmful by one or more of the following exposure routes:

	<p>Breathing in - some substances attack nose, throat or lungs. Others enter body through lungs and harm other parts of the body, e.g. the liver.</p>	
 <p>Ingestion</p>	<p>Skin contact - some substances damage skin, others pass through it and damage other parts of the body.</p>	
	<p>Swallowing - transfer chemicals from hand to mouth by eating, smoking etc. without washing first.</p>	
	<p>Eyes - some vapours, gases and dusts irritating to eyes. Caustic fluid splashes can damage eyesight permanently. Infections can be contracted through splashes.</p>	
	<p>Skin puncture – e.g. sharps and needlestick injuries.</p>	

Some substances are corrosive to skin (acids/bases) and can cause serious burns or may be irritants. Some chemicals by their very nature are readily absorbed through the skin or mucous membranes. These are identified in EH 40 by the annotation **Sk**.

Section 2.3 Workplace exposure limits (WELs)

WELs are British occupational exposure limits and are set in order to help protect the health of workers. WELs are concentrations of hazardous substances in the air, averaged over a specified period of time, referred to as a time-weighted average (TWA). Two time periods are generally used:

- **long-term** (8 hours); to help prevent chronic/cumulative effects which may arise from prolonged and/repeated exposure;
- **short-term** (15 minutes) – Short-term exposure limits (STELs) are set to help prevent effects such as eye irritation, which may occur following exposure for a few minutes.

[HSE's publication EH40/2005 Workplace exposure limits](#) includes the list of substances assigned a WEL. It also provides more detailed guidance on the use of WELs.

For substances assigned a WEL, exposure must be reduced as far as reasonably practicable below the WEL. For substances assigned a STEL, that level must never be exceeded. The absence of a substance from the list of WELs does not indicate that it is safe.

For some toxicological effects, genetic damage and cancer arising from it, the available data and our current state of knowledge do not allow confident identification of exposure levels that present no significant risk. The H-statements relating to these hazardous properties have been assigned a Severe rating. In the absence of a WEL, continue to use the H-statements to identify the hazard, physical characteristics and follow any relevant P-statements.

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Section 8 of the MSDS gives further information on Workplace Exposure Limits.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
formaldehyde	50-00-0	TWA	0.3 ppm 0.37 mg/m ³	Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
	Remarks	Dermal sensitisation Carcinogens or mutagens		
		STEL	0.6 ppm 0.74 mg/m ³	Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
		Dermal sensitisation Carcinogens or mutagens		
		TWA	2 ppm 2.5 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		Capable of causing cancer and/or heritable genetic damage.		
		STEL	2 ppm 2.5 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		Capable of causing cancer and/or heritable genetic damage.		
Methanol	67-56-1	TWA	200 ppm 260 mg/m ³	Europe. Indicative occupational exposure limit values
		Indicative Identifies the possibility of significant uptake through the skin		
		TWA	200 ppm 266 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.		
		STEL	250 ppm 333 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.		

Follow UK. WEL Limits

Physical Hazards (Flammable, Oxidising & Explosive substances)

In addition to health hazards, many substances will also pose a physical hazard in that they cause fire and/or explosion. Fire and explosion risks are covered in separate policy and guidance – [Dangerous Substances and Explosive Atmospheres Regulations \(DSEAR\)](#).

Section 2.4 Human diseases, illnesses or conditions associated with hazardous substances

2.4: Human diseases, illnesses or conditions associated with hazardous substances
[ENTER HEALTH HAZARD STATEMENT(S) (H) HERE]

Provide details of any human diseases, illnesses or conditions associated with exposure to the hazardous substances. For example, many organic solvents can cause respiratory irritation or asthma.

Enter H Statement(s) here, refer to the risk matrix to assign the highest severity hazard.

Section 2.5 Frequency of use

Consider the time people are likely to be potentially exposed and how often they will carry out the process.

Section 2.6 Who might be at risk

Provide details of who will be doing the work and if any other people will be affected by the work. Specify which persons might be directly at risk of exposure to the hazardous substances in the work (e.g. staff, students) and who might be indirectly at risk (e.g. porters, cleaners, or maintenance workers). Could people sharing your workplace be affected by your work (e.g. many labs host more than one working group). Consider whether any particular groups of people might be at increased risk or adversely affected by the work and might not be able to do the work. These include new or expectant mothers, young persons under 18, disabled workers, those allergic to particular substances, and employees who may be more susceptible to some illnesses because of their individual health status.

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Where it is subsequently identified that a person may be at increased risk (e.g. pregnancy) then a specific risk assessment must be done for that individual in the context of the role they perform, see separate guidance [New and Expectant Mothers at Work HS G015 \[PDF 554KB\]](#).

7.3 Section 3 – Risks Before Controls

Risk Rating (Before Control)	Extreme <input type="checkbox"/>	High <input type="checkbox"/>	Medium <input type="checkbox"/>	Low <input type="checkbox"/>
---------------------------------	----------------------------------	-------------------------------	---------------------------------	------------------------------

Using the highest severity rating recorded in section 2.1, work out the likelihood and record the Risk Rating (Before Controls).

7.4 Section 4 – Controls Measures

4.11: Procedural Controls (e.g. lone working, hygiene)					
4.12 Engineering Controls (Select all that apply)	Laboratory <input type="checkbox"/>	Room <input type="checkbox"/>	Controlled area <input type="checkbox"/>	Total containment <input type="checkbox"/>	Glove box <input type="checkbox"/>
Guide to using local exhaust ventilation (LEV)	Fume hood (ducted LEV) <input type="checkbox"/>				Fume hood (recirculatory LEV) <input type="checkbox"/>
4.13 PPE Requirements (Select all that apply)	[ENTER DETAILS HERE]				
Face fit is testing required	 Half mask respirator	[ENTER DETAILS HERE]	 Gloves	[ENTER DETAILS HERE]	
Respiratory protective equipment at work	 Full face mask respirator**	[ENTER DETAILS HERE]	 Footwear	[ENTER DETAILS HERE]	
Glove selection	 Eye Protection	[ENTER DETAILS HERE]	 Protective Clothing	[ENTER DETAILS HERE]	
	 Face Shield	[ENTER DETAILS HERE]	 Other (Specify)	[ENTER DETAILS HERE]	

Using the information gathered, record and select the relevant controls (Procedural/Engineering/PPE) for the procedure based on the severity (hazard) of substance(s), quantity, dustiness/volatility, task (heating/pressurizing), assign the relevant controls to reduce the likelihood of exposure.

Provide details of where the work will be done and how the hazardous substances will be properly contained. It's important to consider the potential routes of exposure in deciding what sort of control measures will be required. Consider if the work can be done in a laboratory or will specialised facilities be required. Will the work require total enclosure (e.g. Class 3 safety cabinets), partial enclosure (e.g. fume cupboard, Class 1 or 2 safety cabinets), local exhaust ventilation (e.g. exhaust ducting from machine tools, soldering or welding operations, some laboratory equipment) or general ventilation (e.g. animal rooms or containment laboratories). You should also consider whether you will need to control access to the area where the work will be done by limiting it to authorised persons only.

Having considered the hazardous nature of the substances and any hazardous operations within the procedure the next step is to define the control measures which should be applied. The COSHH regulations set out a hierarchy of control measures which should be applied and are set out in order of preference. Controlling the risk might include a combination of control measures that should relate to the hazardous properties, quantities used etc.

The first priority is prevention of exposure, for example by;

- changing the method of work or modifying the process so that operations that give rise to the exposure no longer occur;

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- substituting a hazardous substance with one that is of no, or less, hazard. Care is needed as a potential substitute may be much less toxic but considerably more flammable so the overall risk needs to be considered.

If prevention cannot be achieved then control must be achieved by applying a hierarchy of control measures as follows:

- Total enclosure of the process, - e.g. contained within the primary container such as the reaction vessel, or by a glove box;
- Plant, processes or procedures that minimise the creation of, or suppress or contain the substance (gas, fume, dust etc);
- Partial enclosure with local exhaust ventilation (LEV) e.g. fume cupboard;
- LEV, e.g. capture hoods;
- Good general ventilation;
- Restriction of access, reduce the number of people exposed;
- Reduce exposure time;
- Contamination control, e.g. regular cleaning and good housekeeping regimes in laboratories;
- Safe storage and disposal arrangements;
- Adequate stock control to ensure that only the minimum quantities of hazardous substances to satisfy requirements are held on the premises;
- Good personal hygiene, i.e. washing facilities; clothes changing and storage; laundering of contaminated clothes; no eating, drinking etc.; eating facilities;
- Personal protective equipment. **Only where all of the above have been considered and provided wherever practicable;**
- Information, instruction and training in the SOP and ensuring level of supervision relevant to the complexity of the control measures and the degree of risk.

Consideration will need to be given as to which activities are of sufficiently low risk to be undertaken on the open bench and which will require some form of LEV.

Substances that are not:

- harmful via the inhalation route, or
- are used in small quantities, or
- are non-volatile and non-dusty

are likely to be suitable for use on the bench in a well-ventilated laboratory.

Activities involving larger quantities of volatile or flammable liquids and those involving substances which are harmful via the inhalation route are likely to need to be used in a fume cupboard or with other form of local exhaust ventilation (LEV).

PPE

If PPE is to be used, tick the appropriate box to show what PPE will be employed, and describe any specific needs in the text box, e.g. what type of gloves are the most appropriate for the work. For further details please see [SPG 1-09 PPE](#)

Storage of hazardous substances

4.14: Storage requirements of hazardous substances					
[ENTER DETAILS HERE]					

You should consider at this stage the quantity you need and the facilities required to store the hazardous substances or materials. Special conditions may also be required such as ventilation and security. You should take care not to store incompatible substances with or close to each other. For example, flammable substances should be stored separately from acids and oxidising agents.

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<p>SECTION 7: Handling and storage</p> <p>7.1 Precautions for safe handling</p> <p>Advice on safe handling Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.</p> <p>Advice on protection against fire and explosion Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.</p> <p>Hygiene measures Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.</p> <p>7.2 Conditions for safe storage, including any incompatibilities</p> <p>Storage conditions Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.</p> <p>Recommended storage temperature see product label.</p> <p>Storage class Storage class (TRGS 510): 3: Flammable liquids</p> <p>7.3 Specific end use(s) Apart from the uses mentioned in section 1.2 no other specific uses are stipulated</p>

Waste Management and Disposal

4.15: Waste management and disposal							
Liquid <input type="checkbox"/>	Solid <input type="checkbox"/>	Gas <input type="checkbox"/>	Inorganic <input type="checkbox"/>	Organic <input type="checkbox"/>	Aqueous <input type="checkbox"/>	Mixed <input type="checkbox"/>	Other <input type="checkbox"/>
[ENTER DETAILS HERE]							

Please consider the type of waste that will be produced and its route of disposal and check the appropriate box. Waste solvents should not be allowed to accumulate on the bench or in a fume cupboard (dispose after use or end of day). They should be labelled appropriately and stored in a labelled solvent cabinet or transferred to a chemical waste store if one is available to the department.

Monitoring exposure and Health surveillance

Some work will require health surveillance to be carried out – e.g. work with respiratory sensitizers or biological material. This should have been identified at the start of staff employment and Occupational Health will have contacted the manager of any role likely to require this. For new work it is important that Occupational Health are informed as soon as possible.

7.5 Section 5 – Emergency Procedures

4.18: Emergency procedures - Spillage or release		
Specify procedure	General Information: Spills/Leaks: Steps to be taken in case material is released or spilled: Waste disposal method:	
Other actions (if required)	Inform competent person (e.g. principal investigator or school safety officer etc)	Yes <input type="checkbox"/>
	Evacuate and secure laboratory	Yes <input type="checkbox"/>
	Evacuate building by fire alarm	Yes <input type="checkbox"/>
	Evacuate WITHOUT fire alarm (e.g. where there is a risk of explosion)	Yes <input type="checkbox"/>
	Call security (3333 on campus) to alert fire brigade	Yes <input type="checkbox"/>

Please consider what steps should be taken in the event of an emergency, and provide details of people to be contacted, e.g. supervisor or manager. This should be based on a ‘worst case scenario’ where the entire contents of the substance in its supply quantity is spilled. Where concentrations in the room could approach unsafe levels, which are a risk to human health or pose a fire/explosion risk then evacuation of the room or area will be required.

Plan for spillages and how they should be dealt with, is mostly straightforward, but in the case those with

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the potential to cause harm a plan of action should be decided upon in advance with everyone using the technique or chemical being made aware of the details. In the case of organic or reactive materials, you may wish to have evacuation as your immediate response.

Section 6 of the MSDS general advice in relation to dealing with a release.

<p>SECTION 6: Accidental release measures</p> <p>6.1 Personal precautions, protective equipment and emergency procedures Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.</p> <p>6.2 Environmental precautions Do not let product enter drains. Risk of explosion.</p> <p>6.3 Methods and materials for containment and cleaning up Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.</p> <p>6.4 Reference to other sections For disposal see section 13.</p>
--

It is important that workers have access to spill control equipment, and, if appropriate, Respiratory Protective Equipment (RPE) and are trained in how to deal with a spill. If in doubt, evacuate the area and then assess the situation from a place of safety, take appropriate advice from the School Safety Officer and/or University Safety Team and decide what action to take.

First Aid

4.19: First aid
[ENTER DETAILS HERE for other controls stated on the Safety Data Sheet]

Please detail first aid response to be taken in the event of being exposed to the materials listed in section 2.

Section 4 of the MSDS contains relevant first aid advice. Ensure that there are lists of local University First Aiders available in or near the lab.

<p>SECTION 4: First aid measures</p> <p>4.1 Description of first-aid measures</p> <p>General advice First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.</p> <p>If inhaled After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.</p> <p>In case of skin contact In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.</p> <p>In case of eye contact After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.</p> <p>If swallowed After swallowing: fresh air. Make victim drink ethanol (e.g. 1 drinking glass of a 40% alcoholic beverage). Call a doctor immediately (mention methanol ingestion). Only in exceptional cases, if no medical care is available within one hour, induce vomiting (only in fully conscious persons) and make victim drink ethanol again (approx. 0.3 ml of a 40% alcoholic beverage/kg body weight/hour). Do not attempt to neutralise.</p> <p>4.2 Most important symptoms and effects, both acute and delayed The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11</p> <p>4.3 Indication of any immediate medical attention and special treatment needed No data available</p>
--

Actions in event of failure

Consider the action to be taken if services fail, e.g. if there is no water or power to the building. How would this affect the fume cabinets or what alternatives would be employed for wash down if there was no water.

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Instruction, training and supervision

4.21: Training - Instruction and supervision	
Special instructions are required to safely carry out the work (If yes enter details below)	Yes <input type="checkbox"/>
[ENTER DETAILS HERE]	
Special training is required to safely carry out the work (If yes enter details below)	Yes <input type="checkbox"/>
[ENTER DETAILS HERE]	
A: Work may not be carried out without direct personal supervision (If yes enter details below)	Yes <input type="checkbox"/>
B: Work may not be started without the advice and approval of supervisor (If yes enter details below)	Yes <input type="checkbox"/>
C: Work can be carried out without direct supervision	Yes <input type="checkbox"/>
Supervisor(s)	[ENTER DETAILS HERE]

Check the appropriate box as to what level of instruction, training or supervision is required before each member of the team can carry out this work described in section 1.

Consider whether the work can be carried out outside of normal core work hours and how the person would be monitored as to their safety during this time.

7.6 Section 5 – Risks After Controls (refer to risk assessment matrix)

Residual Risk Rating (After Control)	Extreme <input type="checkbox"/>	High <input type="checkbox"/>	Medium <input type="checkbox"/>	Low <input type="checkbox"/>
--------------------------------------	----------------------------------	-------------------------------	---------------------------------	------------------------------

Assign a Residual Risk rating after following controls and **select risk rating on front page (as shown below)**:

7.7 Section 6 – Approval

6.1: Assessed by			
Role	Print name	Signature	Date
[ENTER DETAILS HERE]	[ENTER DETAILS HERE]	[ENTER DETAILS HERE]	[ENTER DETAILS HERE]
6.2: Approved by (Principal investigator or Responsible person)			
Role	Print name	Signature	Date
[ENTER DETAILS HERE]	[ENTER DETAILS HERE]	[ENTER DETAILS HERE]	[ENTER DETAILS HERE]

The supervisor or line manager is the responsible person and this person should sign to approve that the assessment is correct and carried out appropriately

7.8 Section 7 – Review

The assessment should be reviewed every 3 years and immediately if there is reason to suspect that it is no longer valid (for example after any accidents or incidents) or if there is a significant change in the work to which it relates.

When the assessment is reviewed, add below the signature of the assessor and the person responsible for work in that area. If the activity has significantly changed in any way then a new assessment should be undertaken and a new assessment form completed. Any original signatories covered by the modified assessment should sign again.

7.9 Section 8 – COSHH Assessment Acknowledgement

All staff/students or visitors who will be carrying out the work must sign the document to show that they have read the assessment and that they agree to abide by the instructions shown.

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