

1. Introduction:

This guidance note supports the use of the [COSHH Assessment – Hazardous Substances](#) template.

The COSHH Regulations requires employers to assess and manage the risks to employees which may arise because of the presence of substances hazardous to health in the workplace. In addition to this, the Management of Health & Safety at Work Regulations and the Health & Safety at Work Etc. Act requires employers to assess and manage risks to persons not in our employment. The COSHH regulations defines a substance hazardous to health as one that meets any of the below criteria:

1. Is supplied with a relevant Classification, Labelling and Packaging (CLP) Regulation symbol on the packaging, e.g. Full details of the CLP symbols is available in Annex 1.



2. Is listed with an exposure limit in [EH40/2005 Workplace Exposure Limits](#);
3. A biological agent;
4. A dust of any kind, except dust which is a substance within criteria 1. or 2. above, when present at a concentration in air equal to or greater than—
 - 10 mg/m³, as a time-weighted average over an 8-hour period, of inhalable dust, or
 - 4 mg/m³, as a time-weighted average over an 8-hour period, of respirable dust;

A suitable and sufficient assessment of the risks needs to include consideration of numerous factors associated with working with substances hazardous to health. The following list outlines the factors to be considered:

Work with Hazardous Substances Assessment
• The hazardous properties of the substance.
• Information on the health effect provided by the supplier.
• Who might be exposed?
• Level, type and duration of exposure.
• The circumstance of the work including the amount of substance involved.

<ul style="list-style-type: none"> • Activities such as maintenance where there is a potential for a high level of exposure.
<ul style="list-style-type: none"> • Any relevant Workplace Exposure Level (WEL) or Occupational Exposure Limit (OEL).
<ul style="list-style-type: none"> • The effect of preventive and control measures which have or will be taken.
<ul style="list-style-type: none"> • The results of relevant health surveillance.
<ul style="list-style-type: none"> • The results of monitoring of exposure.
<ul style="list-style-type: none"> • If appropriate, the results of exposure to more than one substance in combination.

2. COSHH Assessment – Hazardous Substances:

Step 1: Define your process

COSHH Assessments – Hazardous Substances are activity based and the first important thing to do is to define the boundaries of the activity. To do this complete the first four rows of the template.

Step 2: Identify the Hazards

Identify all the hazardous substances involved in the activity. This should include both those substances being used and those being produced in the course of the activity.

For the substances being used, a Safety Data Sheet (SDS) is the best initial source of information. Registration, Evaluation, Authorisation & Restriction of Chemicals (REACH) requires all suppliers of substances hazardous to health, at initial point of supply, to provide an SDS to the customer. Most suppliers also publish their SDSs on their websites or will provide upon request. REACH, being a European Union Regulation ([No 1907/2006](#)) requires all European suppliers to meet this standard.

For the substances being produced by the activity, or supplied from out-with Europe, it may be necessary to do some research to understand the hazard the substance presents to the operator or those nearby. In addition to an SDS, alternative sources of information might be:

- Internet information
- Industry publications
- Scientific publications
- Colleagues (e.g. Chemists) within the University

To aid in filling out the detail of chemicals used in the process the Annex 2: SDS Road Map can help.

Step 3: Who might be harmed and how?

The next section is “who is likely to be exposed” - it is highly likely this will be the person undertaking the activity involving the hazardous substance(s), although it is critical to consider others that may be exposed. This could include someone working nearby, a cleaner who comes in later in the day to mop the floor and/or a contractor who may be accessing something in the laboratory, or possibly a member of the public as they walk by.

Step 4: What do you currently do?

It is highly likely that work is currently ongoing on this activity and you have already determined a number of control measures. These should not be forgotten as they are extremely valuable. Control measures are defined as:

"A measure taken to reduce (likelihood and severity) exposure to a substance hazardous to health"

It is at this stage you should assess the likelihood of exposure to the stated hazards identified in the initial stages of your assessment. If exposure is not relevant or is negligible with the control measures in place your COSHH assessment and Safe System of Work are complete. If not, then you will need to continue completing the template to finalise your assessment.

Step 5: Can you/do you need to, do more?

When controlling exposure to hazardous substances the following control hierarchy should always be considered. Assessing the opportunities presented by the top control method (Elimination) and when unable to either comply or partially comply, move on to the next. The control hierarchy for COSHH can be seen in Annex 3.

The next step in the assessment is to review the control hierarchy against the hazards present. The following questions asked should help with this and recording the answers to them will ensure you have assessed the possibility of using the preferred methods for control:

Question	Guidance	Answer
Can any of the hazardous substance be removed from the process?	Ask yourself and your colleagues "Do we need to do this, does it add value?" if the answer is yes then ask "Does the substance perform a critical function in the process or can it be removed?"	If yes tick the "Tick all possible" box for row (a).
Can the hazardous substance be substituted with a non/less hazardous substitute?	Ask yourself and your colleagues "Are there any other substances available on the market that would fulfil the same function but are non/less hazardous?" For example Ethidium Bromide can now be replaced with Gel Red.	If yes tick the "Tick all possible" box for row (b).
Can the process be totally enclosed?	This is to do with creating a complete barrier around the process ensuring that a hazardous substance cannot come into contact with an operator. Normally only possible when the activity requires little to no human intervention.	If yes tick the "Tick all possible" box for row (c).

If the above controls, once assessed, are either not practicable or do not control the risk to a reasonably practicable level we need to review the following options:

Question	Guidance	Answer
Can the process be contained?	Ask yourself can we undertake the process within containment, for example if the process requires no intervention from a member of staff it could be fully enclosed or if it requires intervention maybe a glove box could be used.	If yes tick the "Tick all possible" box for row (d).
Can you partially enclose the process or undertake the process within a fume cupboard?	If not able to fully enclose the process could it be partially enclosed, for example extracting the hazardous substance away from the operator and other? Or if not possible limiting the amount of hazardous substance to escape and exposing the operator.	If yes tick the "Tick all possible" box for row (e).
Can you provide local exhaust ventilation such as an extraction arm?	If it is not possible to undertake the activity within a fume cupboard then can it be extracted away from the operator by other means of Local Exhaust Ventilation?	If yes tick the "Tick all possible" box for row (f).

Step 6: How can you reduce the Hazard Further?

Now you need to consider how to reduce the hazard to employees through reduction in the quantity of hazardous substances they can be exposed to. Store the minimum stock levels of hazardous materials that is reasonable for the level of usage in the work area. Large quantities of hazardous materials should be stored in purpose built external chemical stores. This section should be used to document what the maximum expected quantity of the hazardous substance in the work area will be.

In addition to reducing quantities we should be looking to reduce the number of people who could potentially be exposed to the hazardous substance. This can be achieved in numerous ways. For example restricting access to the area where the substance is in use. This section should be used to document what controls are in place to limit the number of people potentially exposed.

Step 7: What are the hygiene rules around the use of this substance?

When considering this questions we need to define what aspects need to be considered. The first and probably most important is the individual handling the substance. Could having the substance on their hands, clothes or face mean that it would be transposed to the mouth and then ingested, causing harm? If the answer is yes then we need to stipulate some good hygiene rules, such as eating, drinking and smoking are prohibited in the work area and ensure you wash your hands prior to eating, drinking and smoking.

Of course to ensure effective hygiene, facilities must be provided. These can be as simple as a wash hand basin and tap. But in more extreme circumstances showers could be required. There is a row provided in the template to document that hygiene measures are adequate and describe their location.

If a hazardous substance is not effectively contained it could potentially end up in the work environment. Cleaning procedures to ensure the quantities of the hazardous substance in the environment are controlled may need to be implemented. Surfaces that can be particular concern are walls and worktops etc.,

as these are the areas where substance can come to rest and form a latent exposure risk. If this is a possibility then a regular clean should be implemented and the frequency of this documented.

Step 8: How do we communicate the hazards to those around us?

It is important that people entering an area where a hazard is present are made aware of its existence through information, instruction and training.

One means of supplementing this is via signage ([Health and Safety \(Safety Signs and Signals\) Regulations 1996](#)). The Regulations require employers to ensure that safety signs are provided (or are in place) and maintained in circumstances where there is a significant risk to health and safety that has not been removed or controlled by other methods. This is only appropriate where use of a sign can further reduce the risk. Safety signs are not a substitute for other methods of control.

Step 9: What groups of people might be at increased risk from the activity?

Some chemicals can be specifically hazardous to certain groups of people. These groups can be numerous dependant on the hazardous nature of the substance. The following non-restrictive list suggests certain groups that would need to be considered:

- Expecting Mothers
- Breastfeeding Mothers
- Young Persons
- Smokers
- Asthma Sufferers
- Individuals sensitised to.....

Through the assessment we need to identify who these groups are. Exposure should be adequately controlled, but where this is not achievable, this may mean a prohibition from undertaking this project/activity. Information that can help in completing this part of the assessment can be found in the SDS. Normally this is provided in section 2 and takes the form of hazard statements. A hazard statement is a phrase that describes the nature of the hazard in the substance or mixture. For a full list of Hazard Statements used in the classification of chemicals can be seen in Annex 4.

Step 10: How are we going to handle this substance and manage it when it's not being used?

We are responsible for managing the hazardous substance from the point it arrives on our premises, including how it is stored, how it is then used and finally how it is disposed of safely using methods compliant with our environmental duties.

Some hazardous substances must be stored in very specific ways. There are some substances that must be stored under oil as they react aggressively with water, some are oxidising or flammable and can accelerate a developing fire. Some substances react together exothermically and can start fires. With this in mind it

is important to then define how the substance will be stored whilst it is not being used. This section provides a space to detail the storage arrangements of the substance.

When decanting a substance it is important to ensure that the new container is appropriately marked. As a minimum, marking should detail the substance's chemical and trade names. Although adding a CLP / GHS sticker to the new container would improve communication to others what the hazard is.

When a hazardous substance is on our campus it presents a hazard whether it is being used or not. As such it should be disposed of as soon as it is possible to do so without impacting University activities.

Step 11: Is pre-employment screening appropriate?

The purpose of pre-employment screening is to reduce the risk of people being placed in jobs that will aggravate existing or past conditions such as sensitisation, asthma or musculoskeletal disorders.

After a basic review, by you the assessor, you feel this is required you must contact the Occupational Health and Environmental Safety Team (OHES).

This could be appropriate if the activities a candidate will be asked to undertake may include repeated exposure to a sensitiser, for example a substance with Hazard Phrase H334.

Step 12: Is ongoing health surveillance necessary?

There are a number of purposes to health surveillance, which include:

- Protecting the health of individual employees by detecting the early signs of adverse changes to health caused by exposure to substances hazardous to health.
- Evaluating the effectiveness of measures to control exposure.
- Collecting, keeping up-to-date and using data and information for determining and evaluating hazards to health.

After a basic review, by you the assessor, you feel this is required you must contact the OHES.

Health surveillance can take numerous forms and is chosen on the basis of the availability of valid health surveillance techniques, the health effects and the level of exposure concerned.

Step 13: What non-routine precautions do/could you undertake?

Through research into accident statistics across the United Kingdom it is evident that it is more likely for employees to have an accident when undertaking non-routine operations. The principle non-routine operation that would need to be considered in relation to hazardous substances is maintenance. Maintenance can result in exposure to a hazardous substance if the activity leaves residues behind or the purpose is to clean up any residues. It is at this point we need to consider

how to plan and control the maintenance activities to ensure we do not cause harm to individuals undertaking the maintenance.

Other non-routine precautions we need to consider are what to do in the event of an emergency. Emergencies can happen when least expected, such as the fire alarm sounding and the impact this can have on your process or the spilling of a hazardous substance. Precautions for emergencies should always document what, who and how to ensure exposure to a hazardous substance is kept to a reasonable minimum.

All processes will have an output, whether that output is the product or waste. When waste is produced that is hazardous to health, e.g. excess chemicals or waste effluent we need to be clear on how this will be collected, secured and uplifted by an appropriate waste contractor. This process needs to be documented to ensure clear communication.

Lone Working, although not a hazard in its own right, can increase the likelihood or severity of a person being exposed to a hazard. When working with hazardous substances accidental exposure can result in a person being injured to a point of being unable to help themselves. Prior to any activity being undertaken it is critical to understand how the hazards are increased under lone working conditions and consider how best to control them. Controls can range from prohibiting the activity being undertaken when lone working or ensuring regular contact with a supervisor or colleague.

Step 14: Do we need Personal Protective Equipment (PPE)?

One of the final control measures to be considered when assessing work with hazardous substances is the provision of Personal Protective Equipment (PPE). The reason PPE is the last control measure to consider is because we aim to manage the hazard effectively controlled before this point. PPE is one of the least effective control measures on offer because:

- It only protects the person wearing it and not those working nearby.
- It requires the person to wear it correctly to be effective (e.g. buttoning up a lab coat).

Despite this, PPE may be necessary to control residual risks. If this is the case you need to detail what PPE is required, how it is used effectively, how it is inspected and maintained and how to store it appropriately.

When detailing the required PPE ensure that you are as specific as possible, so there can be no doubt. For example when stipulating that gloves are worn you should state what type of gloves and the standard they need to be manufactured or tested to.

Step 15: Do employees, expected to undertake this activity, require any information, instruction or training?

In most cases the answer to this question will be yes. As a minimum all employees should be made aware of the hazards associated with the activity and what precautions to implement to control them to a reasonably practicable level.

This can be achieved in a number of ways, how you choose to do this will need to be documented here.

The activity being assessed may require further training to allow the employee to undertake it safely. For example, training on how to handle gas cylinders safely, or perhaps how to work with cryogenics safely.

Step 16: Authorising the assessment

All assessments must be authorised by both the assessor and the manager; the assessor to record who undertook the assessment and the manager who has responsibility for ensure the assessment is implemented and precautions are funded.

Although "regular" review of assessments is not a legal requirement it is best practice in risk management. It is therefore an RGU expectation that all assessments including COSHH Risk Assessments are reviewed at least once per year (if the activity being assessed is greater in duration than one year). If you believe there is a good reason that adds value to the school/department to review the assessment more frequently than this please record it here. Otherwise stipulate the RGU expectation.

Step 17: Summarise

The final page of the assessment is provided to provide an opportunity to summarise the key findings and decisions of the assessment. Use of this page allows the assessment to be effectively communicated to the individuals undertaking the activity, as well as record who the individual should report any problems with the assessment or activity to.

3. Summary

This is a summary of the expected information for each section of the RGU COSHH Risk Assessment form. If you are still unsure how to undertake the assessment please contact the Occupational Health and Environmental Safety Team on x2088

Annex 1: CLP Symbols

Symbol	Name	Brief Description
	Gas Under Pressure	<ul style="list-style-type: none"> • Contains gas under pressure; may explode if heated. • Contains refrigerated gas; may cause cryogenic burns or injury.
	Explosive	<ul style="list-style-type: none"> • Unstable explosive • Explosive; mass explosion hazard • Explosive; severe projection hazard • Explosive; fire, blast or projection hazard • May mass explode in fire
	Oxidising	<ul style="list-style-type: none"> • May cause or intensify fire; oxidiser. • May cause fire or explosion; strong oxidiser.
	Flammable	<ul style="list-style-type: none"> • Extremely flammable gas • Flammable gas • Extremely flammable aerosol • Flammable aerosol • Highly flammable liquid and vapour • Flammable liquid and vapour • Flammable solid
	Corrosive	<ul style="list-style-type: none"> • May be corrosive to metals • Causes severe skin burns and eye damage
	Health hazard / Hazardous to Ozone Layer	<ul style="list-style-type: none"> • May cause respiratory irritation • May cause drowsiness or dizziness • May cause an allergic skin reaction • Causes serious eye irritation • Causes skin irritation • Harmful if swallowed • Harmful in contact with skin • Harmful if inhaled • Harms public health and the environment by destroying ozone in the upper atmosphere

	Acute Toxicity	<ul style="list-style-type: none"> • Fatal if swallowed • Fatal in contact with skin • Fatal if inhaled • Toxic: if swallowed • Toxic in contact with skin • Toxic if inhaled
	Serious Health Hazard	<ul style="list-style-type: none"> • May be fatal if swallowed and enters airways • Causes damage to organs • May cause damage to organs • May damage fertility or the unborn child • Suspected of damaging fertility or the unborn child • May cause cancer • Suspected of causing cancer • May cause genetic defects • Suspected of causing genetic defects • May cause allergy or asthma symptoms or breathing difficulties if inhaled
	Hazardous to the Environment	<ul style="list-style-type: none"> • Very toxic to aquatic life with long lasting effects • Toxic to aquatic life with long lasting effects

Annex 2: SDS Road Map

Section Title	SDS Section Number
Hazardous Substances(s) / Components (s)	3
CAS No.	1
Trade Name (if Applicable)	1
Supplier	Branding on SDS
Hazardous By (Inc. severity)	2
Workplace Exposure Limit (WEL) see EH40	8 (or the EH40)

Annex 3: COSHH Control Hierarchy

Step	Name	Description
1	Elimination /Substitution	Stop using the hazardous substance or where not possible substitute it for a less toxic one.
2	Procedure	Analyse the system of work and identify the key points where exposure may occur. Changing how things are done to reduce the likelihood of exposure.

3	Enclose	Enclose the process so that the substance cannot escape resulting in exposure to individuals working nearby.
4	Extract (HSE Guidance)	Where the substance is being used/produced extract it so that it is drawn away from any individuals working nearby.
5	Reduce	Have as few workers in harm's way as possible to limit the number of people who may be harmed and limit the likelihood of any individuals who are specifically susceptible to the substance.
6	Personal Protective Equipment (PPE)	On the basis of a consideration of the "Nature and extent of exposure" identify the route through which harm is caused and block it. For example if the route is through inhalation then Respiratory Protective Equipment might be selected. Note though PPE selected must be fit for purpose. To determine how to achieve this needs to be researched. Advice can be received from the Occupation Health and Environmental Safety Department.

Annex 4: Hazard Statements

H200	Unstable explosives
H201	Explosive; mass explosion hazard.
H202	Explosive, severe projection hazard.
H290	May be corrosive to metals
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H310	Fatal in contact with skin.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child.
H361	Suspected of damaging fertility or the unborn child.
H362	May cause harm to breast-fed children.
H370	Causes damage to organs.
H371	May cause damage to organs.
H372	Causes damage to organs through prolonged or repeated exposure.

H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.