



# The Control of Substance Hazardous to Health (COSHH) Regulations

## Please Note

Where an activity involves working with biological agents, or may generate a biohazard, the risk to health should be assessed using [Form BA1](#) after reading the guidance available at: <http://www.ed.ac.uk/schools-departments/health-safety/biosafety/policy/guidance-rules>

## Section 1 Basic COSHH guidance

The COSHH Regulations impose duties on the University to protect its staff and any other persons, whether at work or not, who may be affected by the University's work involving substances hazardous to health, including biological agents. The Regulations, and compliance with them, must constitute an integral part of the management system of the University's Schools/ Management Units; compliance with the Regulations not only ensures compliance with the law, but will prevent incidence of ill health, ensure best working practice and will encourage the evolution of a positive health and safety culture within the organisation, whereby our students will be taught by example, the best standards of health and safety.

In order to ensure compliance with the Regulations Heads of School, or equivalent, must ensure that work is not undertaken that is liable to expose any employees, or others, to any substance hazardous to health or that the exposure is kept to a minimum after a suitable and sufficient risk assessment.

The purpose of an assessment is to enable a valid decision to be made about measures necessary to control substances hazardous to health arising from any work. It also enables the employer to demonstrate readily, both to himself and other persons, that all the factors have been considered, and that an informed and valid judgement has been reached about the risks, and the steps that need to be taken to achieve and maintain adequate control.

The COSHH Regulations provide a framework to protect people at work against health risks that may arise from work activities that expose them to hazardous substances. The essential steps that must be taken are:

- Identify hazards intrinsic to substances to be used (safety data sheets)
- Assess the risks to health arising from the use of the hazardous substances in the work activity.
- Decide what precautions and control measures are necessary to minimise the risk.
- Implement the control measures.
- Ensure control measures are used and maintained.

- Monitoring exposure of users (if necessary).
- Consider whether biological monitoring and/or health surveillance is appropriate, or required
- Ensure the users have sufficient information, instruction and training so as to perform the work safely and competently
- Ensure adequate procedures are in place to deal with any emergency situation, which may foreseeably arise

### **Eight Principles of good practice**

The Regulations introduce eight principles of good practice that will apply regardless of whether a substance has been assigned a Workplace Exposure Limit (WEL) (see later for explanation of WEL)

#### **The principles are:**

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.
6. Check and review regularly all elements of control measures for their continuing effectiveness.
7. Inform and train all users 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.

Procedures must be established at School or equivalent level to ensure that any implemented control methods are effective and are being properly used.

Information, instruction and training is necessary for all those using control measures, be they mechanical controls, management controls, etc.

### **Controlling the risk**

COSHH requires that the methodology of risk control be considered in a hierarchical manner:

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1. Identify the hazards to health that substances used, or produced, in a work activity present.

- Avoid the use of hazardous substances
  - Investigate the possibility of achieving the end result in a manner that does not involve the use of hazardous substances (simple example – mechanical fixing v solvent glue fixing);
- Substitution
  - Investigate the possibility of using a less hazardous substance (simple example – use of hypochlorite-free cleaners instead of bleach);
  - Investigate the possibility of purchasing the substance in a safer form, for example pellets as opposed to powder, utilising pre-cast gels etc.

**If either of the above actions is practicable you must implement that route of action.**

2. Assess the risk by;

- Consulting Safety Data Sheets, text books, research papers, etc. to identify the hazards and the exposure routes by which they can adversely affect health, or to predict those in the case of the synthesis of several materials/substances
- Look at how and where the materials are to be actually used in the activity (quantities, volatily, open work area, fume cupboard, etc) and whether the hazardous exposure routes are available;
- Compare the risk with the existing control strategies;
- Introduce or upgrade existing mechanical control measures, (dedicated extract systems, fume cupboards, downdraught tables, etc.) and only if mechanical measures cannot be practicably implemented, or if they alone are insufficient to adequately control the risk, should personal protective equipment be considered and implemented;
- Implement personal protective equipment programme (respirators, eye protection, etc.) [see note on respiratory protective equipment];
- Monitor the effectiveness of the control strategies;
- Ensure that you have control strategies in place for emergency situations e.g. spills

- Consider whether health surveillance is appropriate/required and implement (substances assigned hazard statements H317 or H334 (risk phrases R42 or R42/43 under CHIP)).
- Ensure those involved in, and those potentially affected by, the activity are properly trained and supervised.
- Ensure appropriate disposal procedures are specified.

## Information and Guidance

The notes below are offered to provide general information as regards hazardous substances and risk controls as well as providing sufficient detailed guidance to enable assessors to complete the University's COSHH risk assessment form.

### Safety Data Sheets (SDS)

Safety Data Sheets contain important information as to the health and safety hazards posed by chemicals/substances, required exposure control measures, first aid requirements, spillage containment, safe disposal requirements, etc. It is a legal requirement that the supplier provide these at no cost. The supplier at first supply should automatically provide them, but as this does not always happen in practice, you should ensure that you have the SDS for each hazardous substance that has been purchased by contacting the suppliers as appropriate. SDSs from some common suppliers' websites can be found at <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/sds>

**SDS do not in themselves constitute a risk assessment**, but are merely the starting reference point for such an assessment, as the SDS only gives you information about the substance itself - you must assess the risk from use of the substance in the actual work activity, including amounts, concentrations etc.

Some generic SDS are available on databases accessible via the Internet, unless these sites are those of your actual supplier, the information should be treated with caution as the generic substance may not be identical to the substance you have, and this is particularly important where a hazardous preparation (mixture of substances) is concerned. In such case you should always obtain the dedicated product SDS from the supplier.

## Section 2 Guidance on how to complete the form

**This form can be used to evaluate the hazards of a single substance, group of related substances or a process/procedure as well as any proprietary purchased materials.**

Please note there is also a dedicated COSHH form for work involving biological agents and/or materials that may contain these (BA1 -

<http://www.ed.ac.uk/schools-departments/health-safety/biosafety/forms/risk-assessments>)

## A. Hazard identification

### Hazardous substances

Within COSHH a "substance hazardous to health" means:

- Chemicals and products containing chemicals
- dusts
- fumes, mists, vapours
- nanoparticles/nanotubes
- toxic gases and asphyxiating gases
- biological agents (micro-organisms). If the packaging has any of the [hazard symbols](#) then it is classed as a hazardous substance.
- [micro-organisms in the environment that cause diseases](#) such as leptospirosis or legionnaires' disease **and** micro-organisms used in laboratories.

### Classification of hazards

Ensure that Safety Data Sheets have been obtained from the supplier for all commercial substances. Where the substance is produced as a result of the activity check its hazardous properties and exposure routes (see notes).

1. Name the substance or group of substances to be used, or produced, in the activity and list in the hazards column. Where the substance presents an inhalation hazard and has been assigned a Workplace Exposure Limit (WEL), state this. (See notes on EH40)
2. Classify each of the substances according to one, or more, of the following categories: - Very toxic; Toxic; Corrosive; Harmful; Dermal Irritant; Respiratory Irritant; Carcinogen; Teratogen; Mutagen. Also, state if an airborne substance can also be absorbed through the skin (Sk), or is a respiratory sensitiser (Sen) (see notes on EH40).
3. State any warning or precautionary statements (CLP regulations from June 2015 onwards) denoted in the SDS (pre 1st December 2010 state safety or risk phrases [CHIP classification and labelling]).

### Health and Safety Executive (HSE) Guidance Note EH40

EH40 Workplace Exposure Limits (WEL) is a guidance document in the Environmental Hygiene Series **updated and published annually** by the HSE; it contains listings of all current WEL's assigned to airborne hazards and should be used in conjunction with the current COSHH Regulations. The listings also denote whether a substance is a respiratory sensitiser, or can be

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absorbed through the skin, when of course careful controls require to be implemented to guard against the risk of occupational asthma or synergistic body loading (combined effect of more than one substance), respectively.

A copy in PDF format can be downloaded from the HSE website free of charge, [EH40 pdf](#).

These limits are set to protect the health of workers and are averaged over a specified time period referred to as a time weighted average (TWA). Two time periods are used: long term (8 hours) and short term (15 minutes). The long term exposure limit (LTEL) is intended to control effects that require prolonged or accumulated exposure (chronic effects) e.g. lung and liver disorders, whilst the short term exposure limit (STEL) are intended to control effects that may be evident after only brief exposures (acute effects) e.g. respiratory irritations and eye lacrimation (tears).

In order to comply with the COSHH Regulations WELs **must not** be exceeded.

## **B. Exposure routes**

Identify all likely exposure routes to ensure these are taken account of when formulating your safe system of work.

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 whether that route is available during exposure to the substance (exposure route), for example injection is a possible route if needles are being used during the experiment.

### **Substances may be harmful by one, or more, of the following routes:**

**Inhalation** - respiratory problems, can transfer into circulatory system, Central Nervous System (CNS) disorders

**Ingestion** - poisoning, gastro-intestinal problems

**Dermal contact** - corrosive burns, dermatitis, absorption into the body through the skin, transfer into circulatory system, CNS disorders

**Injection/Inoculation** – (hypodermic needle stick, or cut by contaminated sharp) transfer into circulatory system, CNS disorders, poisoning

**Eye contamination** - absorption into the body, transfer into circulatory system, etc

Consider what controls you may already have in place; if for example, the substance is an inhalation hazard and you are using it in a fume cupboard or glove box, the inhalation route has been eliminated, so there should be no risk via this route!

Consider also that different forms of the same substance can present very different hazards; soft wood is a respiratory sensitiser in the form of respirable size dust particles and therefore a hazard by inhalation, as such it has been assigned a Workplace Exposure Level, in solid form it presents no inhalation risk.

### **C. Engineering control measures**

Identify any control measures required to undertake the work safely.

These may include;

- Open bench work with no further control measures (N.B. inhalation risk must be insignificant – substance must be non-hazardous, or purchased in a form that presents no inhalation risk)
- Open bench work but Local Exhaust Ventilation is required
  - Specify which type of LEV is to be used and when during the activity it must be used
- The work must be carried out wholly within a fume cupboard(s)
- The work must be carried out wholly within a glove box or other sealed system
- The work can be carried out partially on the open bench and partially in an enclosure or partial enclosure (glove box, fume cupboard etc.)
  - Specify which type of enclosure is to be used and what part(s) of the work activity must be carried out within it
- Is air monitoring required to ensure that the control of exposure to the hazardous substance(s) is adequate? N.B. air monitoring is not required if adequate control can be shown by other means, for example all work is carried out on a fume cupboard that is regularly maintained, and performance checked. Contact [occupational.hygiene@ed.ac.uk](mailto:occupational.hygiene@ed.ac.uk) for further guidance if required.

Where control is by mechanical means e.g. fume cupboard, glove box, local extract ventilation the Regulations require that they be thoroughly inspected and tested at least every 14 calendar months. Where such systems form an integral part of a buildings fabric (e.g. a fume cupboard ducted to the roof of a building) this will be undertaken by the Works Division of the Estates and Buildings Department, where the system is of the recirculation type, or an item of School/Unit equipment the School/Unit is responsible for its inspection and test.

The requirement to inspect and test extends to management controls where it may be work methodology or adherence to a Safe System of Work that ensures adequate control, in these circumstances such systems should be subject to audit and monitoring at regular intervals.

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## **D. Personal Protective Equipment (PPE)**

PPE must never be used as the first option of control but must only be used where adequate control of exposure to the hazardous substance(s) cannot be achieved by substitution, or engineering controls alone, or where operating practicalities makes their choice unavoidable. (e.g. transient site working).

Specify in the safe system of work when PPE must be worn. Also consider the need for suitable footwear in the lab to avoid injury if substances are spilt or dropped.

### **Hand Protection**

Identify if any of the following is required (full guidance on glove selection available at <http://www.ed.ac.uk/schools-departments/health-safety/guidance/ppe/gloves-latex>):

- Disposable gloves
  - State which material, for example nitrile etc
- Disposable gauntlet
- Reusable glove
- Reusable gauntlet

### **Special Clothing**

Identify any special clothing that is required for the task:

- Cotton coverall
- Disposable coverall
- Chemical coverall
- Laboratory/Howie coat
- Disposable apron, etc.

### **Eye protection**

Identify any eye protection that is required:

- Safety spectacles
- Impact resistant goggles
- Chemical resistant goggles, etc.

### **Face protection**

Identify any face protection that is required:

- Impact resistant faceshield
- Chemical resistant faceshield
- Faceshield with chin guard, etc.

### **Respiratory protection**

Identify any respiratory protection that is required, full guidance at <http://www.ed.ac.uk/schools-departments/health-safety/guidance/ppe/rpe>:

- Disposable respirator (particulate/water based mists only)
- Reusable half-face respirator
- Full-face respirator
- Powered hood

### **Filter selection**

Check manufacturers Filter Selection Chart for filter and level of protection required.

All wearers of tight fitting masks must be facefit tested, please see full guidance at <http://www.ed.ac.uk/schools-departments/health-safety/guidance/ppe/facefit>

### **Breathing Apparatus**

This is specialist equipment that must only be used by those who have been specifically trained and certificated as competent to use by an authorised trainer. If this equipment is to be used enter the name(s) of the certificated persons in the safe system of work.

## **E. Health monitoring**

### **Health surveillance**

This is required if the employee is working with respiratory or skin sensitisers, (<http://www.hse.gov.uk/asthma/substances.htm>) or substances assigned hazard statements H317 or H334 (risk phrases R42 or R42/43 under CHIP). If required, health surveillance must be arranged via the Occupational Health Unit (50-8190, [occupational.health@ed.ac.uk](mailto:occupational.health@ed.ac.uk)).

**If you or your staff have a compromised respiratory system e.g. asthma, bronchitis, or suffer from a skin disorder, or any other allergic reactions, you/they must inform your supervisor in order that suitable precautions can be taken.**

Further guidance available at <http://www.ed.ac.uk/schools-departments/health-safety/occupational-health/managers/health-surveillance/overview> and <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/sensitisers>

### **Biological monitoring**

Determine if biological monitoring is required based on the risk, exposure etc., using guidance available on the HSE website at

<http://www.hse.gov.uk/pubns/books/hsg167.htm>

Contact the Health and Safety Department for further guidance on obtaining biological monitoring ([health.safety@ed.ac.uk](mailto:health.safety@ed.ac.uk)).

### **F. Training**

All users must be properly trained and supervised and individual training records for all users must be retained for inspection.

### **G. Supervision**

State any supervision required when undertaking this task. Consider the following:

- Undergraduate students
- Postgraduate students
- Post doctoral staff
- Research staff

### **H. Implications for persons not involved in the work activity**

Identify any other persons who may be affected by this task and consider what they may need to be informed of. For example;

- Cleaning/maintenance staff – when can they enter the lab, what to do if they find a spill
- Contractors – permit to work system
- Visitors – supervised access only
- Emergency personnel – any specific access issues, list of which chemicals may be in the lab
- Other staff or students in close proximity

### **I. Emergency procedures**

Consider the following;

- Are written emergency instructions provided at the work sites?
- Do Security and other personnel, for example cleaners, know the emergency procedures?
- Are emergency contact names and telephone numbers are provided at the work site(s)?

- Are proper and sufficient spill kits available and staff are aware of these?
- Has a person with the appropriate training and knowledge been appointed to deal with spillages of particularly hazardous substances?
  - Specify whom and how they are to be contacted
- The operator knows how to summon, if applicable, the following personnel.
  - First aider
  - In house BA team (where present)
  - External emergency services
- The location of the following, if applicable, is known to the operator
  - Eye irrigation point
  - Body shower
  - First aid box

## **J. Waste disposal**

Detail all waste disposal routes for all hazardous substances used or produced. Consider the following:

- Flushing to drain after rendering harmless to persons or the environment
- To general waste collection after rendering harmless to persons or the environment
- Via the Estates and Building's Waste Department's disposal service (<http://www.ed.ac.uk/schools-departments/estates-buildings/waste-recycling/laboratory-waste/special-waste/chemical-waste>)

If in doubt contact the University Waste and Environmental Manager Ext. 514287.

## **K. Accreditation, verification and review**

When this assessment is complete it should be signed and dated by the assessor and then checked and signed by the person responsible for operations in that section of the School/Unit where the work is being carried out. You must ensure that the person undertaking the task is competent to do so and has received sufficient information, instruction and training.

## **L. Review of risk assessment**

The Regulations require that an assessment shall be kept up to date and reviewed if:

- There is reason to suspect that the assessment is no longer valid (for example after an accident or incident); or
- There has been a significant change in the work to which the assessment relates

## **Section 3 Safe system of work and verification by users (separate form)**

The above risk assessment should naturally generate a safe system of work (or standard operating procedure). Specify in this section how the task is to be performed including any safety measures identified and ensure all users have seen this section and signed to verify they have read and understood.

This page could be printed out and displayed in the laboratory as well as issued to all users.

The full risk assessment must be held in a central location where all users can access it if they so wish but they do not have to see the risk assessment unless they ask for it, as long as they have all seen the safe system of work.

## **Section 4 Further guidance**

### **Further guidance available from the Health and Safety Department**

Hazardous substances index - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances>

COSHH guidance - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/coshh>

Guide to working with solvents - the management of health risks - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/solvents>

Hydrofluoric acid - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/hydrofluoric-acid>

Working with sensitisers - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/sensitisers>

CLP regulations - <http://www.ed.ac.uk/schools-departments/health-safety/guidance/hazardous-substances/ghs-clp>