

Guidance Notes for completion of the University's HAZARDOUS SUBSTANCE RISK ASSESSMENT FORM

These notes may be used when completing the University's hazardous substance risk assessment form, which fulfils the requirements of the Control of Substances Hazardous to Health (COSHH) and Dangerous Substances and Explosive Atmospheres (DSEAR) Regulations for a written risk assessment.

1. Experiment / Procedure / Process / Activity / Demonstration:

Give a brief description of the work with sufficient detail so that a person not familiar with the task could understand what it involves and where the risks might arise and/or cross reference a written operating procedure

2. Frequency (hourly, daily, weekly, monthly or 'one-off'):

Indicate the frequency that the work is expected to be carried out at. This could be all day every day, once a day, once a week, once a month or even once a year. The frequency of use will indicate the potential level of exposure and is a factor to consider in the risk assessment.

3. Hazardous substances to be used:

List **ALL** substances chemicals used or produced including solvents, expected products and by-products etc.

The first principle of the COSHH regulations is to avoid the risk wherever reasonably practicable, therefore if a non-hazardous or less-hazardous substance can be used it should be substituted for the more hazardous material.

i). Substance:

List **ALL** chemicals the by their full, or commonly understood name; generally this will not be initials unless supported by the full name.

ii). Approx. quantity:

The quantity used in each procedure; in milligrams, grams or kilograms.

iii). Physical Form:

The form of the substance used and to which the listed hazard applies.

iv). Hazards:

State the hazard(s) that the listed substance presents in the form that it is to be used. Hazards may be identified from the label of the container the substance was supplied in and from the Material Safety Data Sheet (MSDS) that should be supplied with the substance (or downloaded from the web).

When working with substances which are known or are believed to have toxic properties it is advisable to cross check a number of current MSDS's from reputable sources on the web.

Note; under new EU regulation (REACH) the nature of the information contained in MSDSs will change and should include additional user guidance, but an MSDS is not a substitute for your risk assessment of what you are actually doing with the hazardous substance.

v). WEL

The Government's Health and Safety Executive (HSE) publishes a list of airborne Workplace Exposure Limits (WELs) for gases, vapours and dusts which **must not be exceeded** *. Therefore the need for air monitoring may be a consideration of the risk assessment. However, the guiding principle of COSHH is to reduce exposure to as low a level as reasonably practicable via engineering control measures. In a research environment the rigorous application of this principle often alleviates the need to conduct regular air monitoring, as long as the control measures themselves are regularly serviced and monitored (LEV, including fume cupboards must be checked every year).

* WELs are either Long Term Time Weighted Averages over 8 hrs or Short Term limits for 15 mins, set by the HSE at a level which they consider acceptable for 'most' people to be exposed to, however they are not necessarily 'safe' levels.

vi). Risk Phrases / GHS Hazard Statements:

List the Risk Phrases and/or the new Globally Harmonised System (GHS) Hazard Statements by number, see attached list, taking them into consideration alongside the list of hazards in the risk assessment.

vii). Exposure Route(s)

Identify the potential exposure route(s) for the substances listed in relation to the task, generally these will be inhalation, absorption, ingestion, or injection.

The route of potential exposure is critical to the selection of suitable control measures in your risk assessment.

5. Which are the significant chemical hazards?

If appropriate use this space to identify the significant chemical hazards that require rigorous assessment. The objective is to focus the risk assessment on the significant hazards in cases where numerous potential hazards could obscure the significant one(s).

6. Risks associated with the procedure:

List all the reasonably foreseeable risks associated with the procedure in sufficient detail to identify the control measures necessary to prevent exposure to substances hazardous to health as far as reasonably practicable.

Risk assessments should also consider whether the process has the potential to produce a fire or explosion, either directly or via an explosive atmosphere. An explosive atmosphere being one in which the proportion of gas/vapour/dust and air/oxidant are within the explosive range for that substance[†]. Simple single substance explosive ranges are published however mixtures represent a greater challenge.

The underlying principles of DSEAR are firstly to avoid generating explosive atmospheres, and/or where this is not reasonably practicable, to remove potential sources of ignition and then to put in place mitigating measures to minimise the consequences of control failure.

[†] European Industrial Gas Association (EIGA) guidance states that "provided the room is more than 10,000 times the volume of the explosive atmosphere, an explosive atmosphere less than 10 litres can, depending on local circumstances, be deemed to be non hazardous". However if the explosive atmosphere is in a container the room size is irrelevant, ie as little as 20 ml of solvent in a small non-sparkproof fridge can and has caused a significant explosion.

7. Are any of the substances a Category 1 or 2 carcinogen, a mutagen, a substance toxic to reproduction, a respiratory sensitizer or a skin sensitizer?

Substances having one or more of the listed risk phrases (R numbers) or Hazard Statements attributed to these hazard classes should be identified on the risk assessment for particular attention as they represent a significant hazard to health and must be very strictly controlled in a fume cupboard, glove-box or by similar containment. Those working with them should complete a health record form and submit it to the DSO annually. These records must be kept by the Department for 40 years in accordance with the COSHH Regulations.

8. Control Measures:

Selecting and using the correct control measures is the object of any hazardous substance risk assessment.

The control measures should be suitable and sufficient to control the risk(s) presented by the hazards identified above in the process being assessed. Where additional controls beyond those described are required they should also be recorded here.

In line with the COSHH hierarchy of control, Personal Protective Equipment (PPE) should only be considered when the risk(s) can not be controlled by engineering methods.

i). **Where hazardous chemicals are handled it would be the expectation that eye protection would be identified as being required by the risk assessment and the type should be identified and specified.**

ii). Where there is a risk of hazardous chemicals contaminating the users clothing, either in the course of the work or as a result of a spillage or accident, a laboratory coat or overalls should be used.

iii). Where there is a risk of hazardous chemicals contaminating the hands, then gloves of a suitable type and material should be used. When selecting gloves consider whether they are required for splash protection or immersion.

However, immersion of hands in hazardous chemicals should be avoided wherever possible through the use of engineering controls.

Consideration should be given to the ability of many chemicals to permeate through glove materials. Chemical 'breakthrough times' are published by glove manufacturer's for some common chemicals (organic chemicals pose a greater risk of permeating through gloves than dilute aqueous solutions).

If disposable gloves are used for splash protection they should be changed immediately if contaminated by a chemical with a short 'breakthrough time'.

Note: Different glove materials have different chemical resistances and disposable gloves may have been manufactured with 'pinholes' in them: See University glove selection guidance - <http://www.admin.cam.ac.uk/cam-only/offices/safety/publications/hsd168c/hsd168c.pdf>

iv). Respiratory Protective Equipment (RPE), in the form of disposable masks, half masks or full face masks should be the last resort for protection against inhalation after all other methods of protection have been considered.

All types of RPE legally require face-fit-testing under COSHH (including disposable facemasks) if they have been identified as a control measure in the risk assessment .

Note: Face-fit-testing should be carried out by a trained competent tester and is specific to the individual and the make and model of mask tested.

In certain circumstances loose fitting hoods, which are supplied with air from a rechargeable battery operated filter pack may be appropriate; since they are loose fitting they do not require a face-fit-test.

9. Monitoring:

In some cases monitoring for air borne vapour, dust or gas may be required either to protect the health of those who might be exposed or to prevent an explosive atmosphere, in the latter case it may be appropriate to introduce shut off valves connected to the monitor that operate if a leak is detected or if a critical level is reached.

10. Are any additional controls required not covered above?

This could include shut off valves, oxygen depletion alarms, as well as training, instruction, information or maintenance etc....

11. Are there non-chemical hazards requiring further risk assessment ?

If there are cross reference the additional assessment

12. Waste Disposal Routes:

Waste chemicals must be considered in the risk assessment with at least the same care as any other chemical. Waste should be segregated according to hazard class and incompatible waste should not be mixed in the same container, these factors require consideration in the risk assessment. The mixing of incompatible waste can result in waste containers exploding !

13. Emergency Procedures:

Emergency procedures should be identified in the risk assessment including the consequences of control measure failure and what to do.

Emergency procedures should be thoroughly understood by all users, without recourse to the risk assessment should an incident occur.

14. Emergency Treatment in Case of Contamination or Exposure:

Standard emergency procedure are detailed in this section if they are not appropriate or if additional procedures are required the form should be amended, either way the box should only be ticked once the user has read and understood the emergency procedures.

16. Signatures etc:

Both the assessor and the supervisor must sign and date the form.

17. Record of Individuals Carrying Out Procedure

This allows the group or department to record: the names of those using the procedure, whether training has been given or is needed, a statement by the individual that they have read and will abide by the risk assessment and by the supervisor that they accept the individual is competent to do it.