

CONTROL of SUBSTANCES HAZARDOUS TO HEALTH (COSHH) Guidance Notes on Risk Assessment



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1 INTRODUCTION

The cornerstone of the COSHH regulations is the requirement to assess risk.

Briefly, if a proposed work activity is liable to expose a person to a substance hazardous to health, then that activity must not be carried out until a suitable and sufficient risk assessment has been completed.

In addition each risk assessment must be reviewed and where necessary changed where there is reason to suspect that it is no longer valid or there has been a significant change in the activity to which it relates. In any case the risk assessment should be reviewed at least every five years.

This guidance document is intended to assist assessors within the University to comply with these requirements.

The following publications must be available to those persons carrying out the assessment.

- Control of Substances Hazardous to Health - The Regulations.
- Control of Substances Hazardous to Health - Approved Codes of Practice (Biological Agents, Carcinogens).
- Chemicals (Hazard Information and Packaging for Supply) Regulations.
- Occupational Exposure Standards (EH40) (Includes Biological Agents and Carcinogens).
- Approved Codes of Practice - Categorisation of biological agents according to hazard and categories of containment.

All the above documents are available from HSE Books or one of the agents approved by them. Reference copies are held by the Health and Safety Unit.

Additional information can be obtained from the following sources:

- Information provided by the suppliers of a substance (e.g. on labels or Material Safety Data Sheets).
- Guidance material published by the Health and Safety Executive or other authoritative bodies.
- Experience obtained and information gathered as a result of previous use of the substance or similar substances.
- Technical reference sources.
- Professional institutions, trade associations and trade unions.

2 GUIDELINES FOR RISK ASSESSMENT

The COSHH regulations make it a legal requirement that any assessor should receive the necessary information, instruction and training. Only then is the assessor deemed to be competent.

Heads of dept/div/unit should monitor the quality of risk assessments to satisfy themselves that they are being carried out in a competent manner.

Where possible the risk assessment should be in typewritten form, using the University proforma (see Appendix A). Where absolutely necessary, hand-written assessments may be acceptable as a temporary measure, provided that they are legible and that typewritten copies are produced as soon as possible. In all cases, the final typewritten risk assessment should bear the signature of the Head of dept/div/unit.

At least two typewritten copies of each assessment should be produced:

One copy must be handed to each person carrying out the activity.
One copy should be retained on file by the dept/div/unit.

Read the following guidelines carefully, they are designed to assist the assessor to complete a suitable and sufficient risk assessment. The subheadings 2.1 to 2.4 correspond to box headings in the proforma.

2.1 Activity

This box must contain a short description of the work activity that is to be assessed.

2.2 Reasons for Activity

In many situations this may have been answered sufficiently in box number 1. If this is not the case further information must be supplied.

2.3 Status of Persons Undertaking the Activity

So far as employees are concerned this must be their job title.

With regard to students the information provided must include their course title and present year.

Where an activity may be carried out by a range of students with varying degrees of competence it is important that those students having the least experience are identified for the purposes of risk assessment.

2.4 Hazardous Substances Used and Hazard Information

Where the hazardous substances are chemicals or biological agents the full and correct scientific names must be listed. Where practicable **all** the hazardous substances involved in an activity should be dealt with in **one** risk assessment.

In the case of proprietary materials all the constituents considered hazardous to health must be listed. These should be identified from the information contained within the relevant Material Safety Data Sheets which must be provided by the supplier.

In the case of airborne dust it is important that the nature and source of the dust is identified and listed.

The list of hazardous substances considered should include those, which, though not present initially, may be created by the activity, either by accident or design. This may include wastes, exhaust gases, fumes from gas appliances etc.

A substance must be considered hazardous to health if it falls within the following categories.

- a) Very toxic
- b) Toxic
- c) Harmful
- d) Corrosive
- e) Irritant
- f) Substances with a Maximum Exposure Limit (MEL).
- g) Substances with an Occupational Exposure Standard (OES)
- h) Biological agents as defined by the Biological Agents Approved Code of Practice
- i) Dust (as defined in Regulation 2)
- j) Any substance not in (a) - (i) above but which creates a health hazard comparable to any of them







When considering whether a substance is considered hazardous to health a number of other factors need to be taken into account. Different forms of the same substance may present different hazards. For instance some substances have a fibrous form, which may present a serious hazard to health if the fibres are a certain size or shape. Refer to COSHH General Approved Codes of Practice for detailed additional factors.

Where a substance is hazardous to health solely by virtue of its radioactive, explosive or flammable properties, or solely because it is at a high or low temperature or high pressure, it is exempted from the requirements of the COSHH Regulations.

However, there is still a legal requirement to pass this information on to the end user under existing legislation. It will often be the case that precautions to deal with these properties influence the options available under COSHH. Therefore it may be prudent to use the risk assessment proforma to disseminate the information under the Hazard Classification Heading.

Hazardous chemicals provided by suppliers should arrive in containers labelled with the correct warning symbols. Material Safety Data Sheets should also be supplied and these will contain more detailed information.

Categories of danger, health effects and hazard symbols that are relevant to COSHH are illustrated below. It should be noted that identical symbols must be affixed to any other container to which the substance is transferred for subsequent supply to the end-user.

Very toxic	Chemicals, which in very low quantities cause death or acute or chronic damage to health when inhaled, swallowed or absorbed through the skin.	
Toxic	Chemicals, which in low quantities cause death or acute or chronic damage to health.	
Harmful	Chemicals, which may cause death or acute or chronic damage to health.	
Corrosive	Chemicals, which, on contact with living tissues, may destroy them.	
Irritant	Non-corrosive chemicals, which, through immediate, prolonged or repeated contact with the skin or mucous membrane, may cause inflammation.	
Sensitising	Chemicals, which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction by hyper sensitisation such that on exposure to the chemical, characteristic adverse effects are produced; sensitisers may be classified as: a) sensitising by inhalation; b) sensitising by skin contact.	
Carcinogenic	chemicals which, if they are inhaled or ingested or if they penetrate the skin,	

may cause or increase the incidence of cancer:

Category 1: substances known to be carcinogenic to human beings.



Category 2: substances, which should be regarded as if they are carcinogenic to human beings (based on strong evidence from animal studies, etc).



Category 3: substances, which are possibly carcinogenic to human beings, but in respect of which there is insufficient information to make a satisfactory assessment.



Mutagenic

chemicals which, if they are inhaled or ingested, or if they penetrate the skin, may induce heritable genetic defects or increase their incidence:

Category 1: substances known to be mutagenic to human beings.



Category 2: substances, which should be regarded as if they are mutagenic to human beings.



Category 3: substances, which cause concern to man owing to possible mutagenic effects.



Toxic for reproduction

chemicals which may produce or increase the incidence of non-heritable adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity:

Category 1: substances known to impair human fertility or cause developmental toxicity (i.e. harm the unborn child).







Category 2: substances, which should be regarded as if they impair human fertility or cause developmental toxicity.
Category 3: substances which cause concern for human fertility or which cause concern for humans owing to possible developmental toxicity effects.



Classification of Biological Agents

Group 1	Unlikely to cause human disease.
Group 2	Can cause human disease and may be a hazard to employees; it is unlikely to spread to the community and there is usually effective prophylaxis or treatment available.
Group 3	Can cause severe human disease and may be a serious hazard to employees; it may spread to the community, but there is usually effective prophylaxis or treatment available.
Group 4	Causes severe human disease and is a serious hazard to employees; it is likely to spread to the community and there is usually no effective prophylaxis or treatment available.

The following list describes hazardous physico-chemical properties that substances may exhibit. This information must be disseminated to the end user and must also be borne in mind during the assessment process.

Explosive	Chemicals which may react exothermically without atmospheric oxygen, quickly evolving gases, and which under defined test conditions detonate, quickly deflagrate or upon heating explode when partially confined.	
Oxidising	Chemicals, which give, rise to a highly exothermic reaction in contact with other substances, particularly flammable substances.	
Extremely flammable	a) Liquids having an extremely low flashpoint (below 0°C) and low boiling point (equal to and less than 35°C) b) Gaseous substances and preparations which are flammable in contact with air at ambient temperature and pressure.	
Highly	a) Chemicals which may become	

flammable

hot and finally catch fire in contact with air at ambient temperature without any application of energy.

- b) Solids, which readily catch fire after, brief contact with a source of ignition, and which continue to burn or be consumed after the removal of that source.
- c) Liquids having a very low flashpoint (equal to and less than 21°C) but not classified as 'Extremely flammable'.
- (d) Chemicals, which evolve dangerous quantities of highly flammable gases when in contact with water or damp air.

Flammable

Liquids of low flashpoint (equal to and greater than 21°C, equal to and less than 55°C).

Respiratory Sensitisers

Respiratory sensitisers can induce an allergic type reaction in a sensitised individual. After sensitisation, exposure to extremely small quantities may cause respiratory symptoms.

Respiratory sensitisers have been classified under the CHIP Regulations and assigned the risk phrase R42 'may cause sensitisation by inhalation'. The COSHH Regulations apply to these substances, and a list of them is updated each year in EH40.

Carcinogens

Substances defined as carcinogens for the purposes of the COSHH Regulations are subject to the requirements of the Carcinogens Approved Code of Practice contained within the publication 'COSHH Approved Code of Practice'.

The risk phrases R45 (may cause cancer) and R49 (may cause cancer by inhalation) are used to identify known and suspected carcinogens.

A list of these substances is updated each year in EH40.

3 RISK AND SAFETY PHRASES

Suppliers are obliged to provide information, regarding hazardous substances, in the form of statutory risk and safety phrases.

These phrases, which should appear on the label and the MSDS, will provide the assessor with hazard information and will assist in the selection of appropriate control measures.

4 SUMMARY OF SUBSTANCE IDENTIFICATION AND HAZARD CLASSIFICATION

- List correct scientific names where possible.
- Where a proprietary material is used, list all constituents hazardous to health.
- Identify and list hazardous properties.

5 RISK ASSESSMENT

It is a common misconception that risk assessment is the identification of the hazardous properties of a substance. The hazardous properties of a substance constitute its **potential** to cause harm. The **risk** is the likelihood that it will cause harm in the actual circumstances of use. An assessor must appreciate the difference between these two concepts.

The purpose of a risk assessment is to ensure that a valid decision is made about the measures to be taken to prevent or control exposure to substances hazardous to health.

In practical terms a risk assessment will demonstrate that a judgement has been reached about:

- the risks;
- the steps to be taken to actuate and maintain adequate control;
- the need for monitoring;
- the need for health surveillance.

A risk assessment is required by the Regulations to be "suitable and sufficient". The following list identifies the properties a "suitable and sufficient" risk assessment would contain:

- an assessment of the risks to health;
- consideration of the practicability of preventing exposure to hazardous substances;

- the steps which need to be taken to achieve adequate control of exposure where prevention is not reasonably practicable, in accordance with Regulation 7;
- identification of other action necessary to comply with Regulations 8-12 (these regulations are summarised in Appendix B).

The amount of detail required in a risk assessment will be determined by a number of factors:

- the degree of risk and conclusions about the adequacy of proposed or existing control measures;
- knowledge gained through previous experience;
- existing records concerning the substances involved, persons exposed, their activities and previous exposure results.

There will be occasions when it will only be necessary to read suppliers' data sheets to conclude that existing procedures and practices will satisfactorily control exposure. On other occasions it will be necessary to obtain further information via HSE guidance notes, technical/scientific papers or trade literature to estimate likely exposure and hence to decide upon appropriate control measures.

It should be borne in mind that hazardous substances can enter and damage the body by a variety of routes – principally by inhalation, skin absorption, ingestion or exposure of the eyes.

Where a substance has been assigned a Maximum Exposure Limit or Occupational Exposure Standard the assessment may include a recommendation that workplace measurement of airborne contaminants should be carried out.

A pragmatic, common sense approach should be adopted with regard to writing assessments. The principle behind risk assessment is that it should enable a person undertaking an activity (whatever their expertise) to:

- understand the hazards of the substance used in the activity,
- appreciate the necessity to implement appropriate control measures to minimise the risk to health.

6 PREVENTION/CONTROL OF EXPOSURE

Prevention of Exposure

Regulation 7(1), reproduced in its entirety in Appendix C makes it clear that the employer must consider **preventing** exposure to a hazardous substance if this is reasonably practicable. Consideration must therefore be given to how this might be achieved.

It is not sufficient to assume blindly that an activity to be assessed **must** be allowed to go ahead. The level of risk may well be unacceptable. In such a case, prevention of exposure should be achieved by **ceasing the activity**.

If, within an activity, a single substance presents an unacceptable risk, it may be possible to prevent exposure by **substituting a new substance or different form of the same substance**.

If the above precautions are not reasonably practicable, then one of the following strategies must be adopted.

Control of exposure to biological agents

Special provisions relating to biological agents are described in Schedule 3 of the Regulations and the Approved Code of Practice.

Control of exposure to carcinogens

If complete prevention is not reasonably practicable, the control measures listed in regulation 7(3)(a)-(h) **must all be taken**. In addition, regulation 7(9) lays down the steps an employer must take in the event of the failure of a control measure.

Control of exposure to hazardous substances not classified as biological agents or carcinogens

So far as is reasonably practicable, control of exposure should be achieved by measures other than personal protective equipment.

The Approved Code of Practice recommends that any combination of the following should be considered:

- a) totally enclosed process and handling systems;
- b) plant or processes or systems of work which minimise generation of, or suppress or contain, the hazardous dust, fume, etc and which limit the area of contamination in the event of spills and leaks;
- c) partial enclosure, with local exhaust ventilation;
- d) local exhaust ventilation;
- e) sufficient general ventilation;
- f) reduction of numbers of employees exposed and exclusion of non-essential access;
- g) reduction in the period of exposure for employees;
- h) regular cleaning of contamination from walls, surfaces, etc;

- i) provision of means for safe storage and disposal of substances hazardous to health;
- j) prohibition of eating drinking, smoking, etc in contaminated areas;
- k) provision of adequate facilities for washing, changing and storage of clothing, including arrangements for laundering contaminated clothing.

If the above measures fail to provide adequate control, then, in addition, suitable protective clothing should be used.

The Approved Code of Practice describes some situations where personal protective equipment may be necessary and these include:

- a) where it is at present not technically feasible to achieve adequate control of exposure by process, operational and engineering measures alone. In these cases, exposure should be reduced so far as is reasonably practicable by these measures, and then, in addition, suitable personal protective equipment should be used to secure adequate control;
- b) where a new or revised assessment indicates that personal protective equipment is necessary to safeguard health until such time as adequate control is achieved by other means;
- c) where urgent action is required, e.g. because of plant failure, the only practicable solution in the time available may be the provision and use of personal protective equipment; and
- d) during routine maintenance operations. Although exposure occurs regularly during such work, the infrequency and small number of people involved may make process control measures unwarranted.

To determine the appropriate control method the assessor must have a good working knowledge of the activity or the work area in which the activity is proposed to take place. The flow chart (Appendix D) should also be consulted.

First Aid/Spillage/Disposal Procedure

Where possible, the assessor should give details of these procedures for individual substances.

Where this is not feasible, e.g. because a generic approach to assessment is adopted, then the assessor should specify where the information may be obtained.

Sources may include MSDS, standard works, government publications, etc. It is absolutely essential that sources quoted, and any relevant first-aid equipment, should be accessible to persons carrying out the activity, at the time and place of the activity.

Health Surveillance/Exposure Monitoring

If the assessor considers that health surveillance and/or monitoring of exposure may be necessary, then this should be stated in the assessment, and the Health and Safety Unit should be consulted. To what extent health surveillance is required will be decided by an Occupational Health Consultant appointed by the University.

7 ADDITIONAL INFORMATION

These guidelines are not a summary of the COSHH Regulations or the Approved Code of Practice. In some cases the assessor may require further advice and assistance.

Where possible problems regarding risk assessment should be addressed within the Department/Division/Unit.

Where serious problems are encountered then the University Health and Safety Unit should be consulted.

APPENDIX 1

The MANCHESTER METROPOLITAN UNIVERSITY
COSHH RISK ASSESSMENT

FACULTY	DEPARTMENT/DIVISION/UNIT
ACTIVITY	
REASONS FOR ACTIVITY	
STATUS OF PERSONS UNDERTAKING ACTIVITY	
HAZARDOUS SUBSTANCES USED AND HAZARD CLASSIFICATION	
RISK ASSESSMENT	
DATE OF RISK OF ASSESSMENT	LAST REVIEW DATE
SIGNATURE OF ASSESSOR	SIGNATURE OF HEAD OF DEPT/DIV/UNIT

APPENDIX B

Regulations 8 – 12 (brief summary)

Regulation 8 ‘Use of control measures etc’

Describes the duties of employers and employees with regard to the appropriate use and application of control measures including personal protective equipment.

Regulation 9 ‘Maintenance, examination and test of control measures etc’

Lays down requirements for the maintenance, examination and testing of control measures including personal protective equipment.

Regulation 10 ‘Monitoring exposure at the workplace’

Describes the circumstances under which the exposure of persons to substances hazardous to health should be monitored. Lays down a regime for record keeping.

Regulation 11 ‘Health surveillance’

Describes the circumstances under which it is appropriate for a health surveillance scheme to be implemented. Health surveillance may include medical surveillance under the supervision of an employment medical adviser or appointed doctor. Lays down a regime for record keeping.

Regulation 12 ‘Information, instruction and training for persons who may be exposed to substances hazardous to health’

Lays down the requirement for the employer to provide information, instruction and training. Identifies the type of information to be provided.

APPENDIX C

Regulation 7: Prevention or Control of Exposure to Substances Hazardous to Health

Regulation 7, 'Prevention or control of exposure to substances hazardous to health' is of fundamental importance with regard to the process of risk assessment. It is reproduced in its entirety below, and should be fully understood before any risk assessment is attempted.

- 1 Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.
- 2 So far as is reasonably practicable, the prevention or adequate control of exposure of employees to a substance hazardous to health, except to a carcinogen or a biological agent, shall be secured by measures other than the provision of personal protective equipment.
- 3 Without prejudice to the generality of paragraph (1), where the assessment made under regulation 6 shows that it is not reasonably practicable to prevent exposure to a carcinogen by using an alternative substance or process, the employer shall apply all the following measures, namely –
 - a) the total enclosure of the process and handling systems unless this is not reasonably practicable;
 - b) the use of plant, processes and systems of work which minimise the generation of, or suppress and contain, spills, leaks, dust, fumes and vapours of carcinogens;
 - c) the limitation of the quantities of a carcinogen at the place of work;
 - d) the keeping of the number of persons who might be exposed to a carcinogen to a minimum;
 - e) the prohibition of eating, drinking and smoking in areas that may be contaminated by carcinogens;
 - f) the provision of hygiene measures including adequate washing facilities and regular cleaning of walls and surfaces;
 - g) the designation of those areas and installations which may be contaminated by carcinogens, and the use of suitable and sufficient warning signs; and
 - h) the safe storage, handling and disposal of carcinogens and use of closed and clearly labelled containers.

- 4 Where the measures taken in accordance with paragraph (2) or (3), as the case may be, do not prevent, or provide adequate control of, exposure to substances hazardous to health to which those paragraphs apply, then, in addition to taking those measures, the employer shall provide those employees with such suitable personal protective equipment as will adequately control their exposure to those substances.
- 5 Any personal protective equipment provided by an employer in pursuance of this regulation shall comply with any provision in the Personal Protective Equipment (EC Directive) Regulations 1992^(a) which is applicable to that item of personal protective equipment.
- 6 Where there is exposure to a substance for which a maximum exposure limit has been approved, the control of exposure shall, so far as the inhalation of that substance is concerned, only be treated as being adequate if the level of exposure is reduced so far as is reasonably practicable and in any case below the maximum exposure limit.
- 7 Without prejudice to the generality of paragraph (1), where there is exposure to a substance for which an occupational exposure standard has been approved, the control of exposure shall, so far as the inhalation of that substance is concerned, be treated as adequate if –
 - a) that occupational exposure standard is not exceeded; or
 - b) where that occupational exposure standard is exceeded, the employer identifies the reasons for the standard being exceeded and takes appropriate action to remedy the situation as soon as is reasonably practicable.
- 8 Where respiratory protective equipment is provided in pursuance of this regulation, then it shall:
 - a) be suitable for the purpose; and
 - b) comply with paragraph (5) or, where no requirement is imposed by virtue of that paragraph, be of a type approved or shall conform to a standard approved, in either case, by the Executive.
- 9 In the event of the failure of a control measure, which might result in the escape of carcinogens into the workplace, the employer shall ensure that:
 - a) only those persons who are responsible for the carrying out of repairs and other necessary work are permitted in the affected area and they are provided with suitable respiratory protective equipment and protective clothing; and
 - b) employees and other persons who may be affected are informed of the failure forthwith.

- 10 Schedule 3 of these Regulations shall have effect in relation to biological agents.
- 11 In this regulation “adequate” means adequate having regard only to the nature of the substance and the nature and degree of exposure to substances hazardous to health and “adequately” shall be construed accordingly.