

# CARCINOGENIC CHEMICALS GUIDELINES

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## 1 Introduction

Certain chemicals are known to cause cancer in humans, while many others have been shown to cause cancer in experimental animals. Direct application of experimental carcinogenicity data to humans is not possible, doses of carcinogen required to produce tumours in animals may vary between species and some pathological responses, such as production of benign tumours in mice, appear to be restricted to a single species. Despite such limitations, it is generally accepted that chemicals established as carcinogenic in animals may offer a carcinogenic hazard to humans.

These guidelines are designed to complement safe laboratory practices and minimise the hazards associated with the use of chemicals for which evidence of carcinogenicity has been obtained either by epidemiology or from studies in experimental animals.

Any work that involves the use of listed carcinogens (refer to Appendices) has special requirements under the Work Health and Safety Regulation 2011.

There are two types of listed carcinogens:

- Prohibited carcinogens (Appendix 1) – are prohibited from use but can be used for limited research and analysis provided WorkCover is notified first.
- Notifiable carcinogens (Appendix 2) – are those chemicals that can be used once WorkCover has been notified;

## 2 Responsibilities

### 2.1 Staff and Students

All staff and students are required to work together with the University and, in relation to the tasks that affect them directly, contribute to the process of identification, assessment and control, and support implementation of the legislation by participation in:

- risk assessments;
- consultation;
- training;
- monitoring and health surveillance if required.

### 2.2 Laboratory Managers and Supervisors

Laboratory managers and supervisors are required to ensure that laboratories comply with health and safety legislation and UOW guidelines within their area of responsibility. This includes:

- Informing WorkCover of intention to work with a notifiable or prohibited carcinogenic substance
- Completion of risk assessments and safe work procedures
- Completion of [Statement of Exposure](#) on completion of workers or students employment as outlined in Section 4
- Regular workplace inspections and completion of corrective actions
- Ensuring equipment is managed safely
- Maintenance program in place for plant and safety equipment
- Required PPE is provided, is in use and is used correctly
- Required signage is provided indicating PPE requirements and access restrictions
- Appropriate use, labelling and storage of carcinogenic chemicals.

### 2.3 Unit Heads and Managers

Unit heads and managers are required to implement health and safety legislation and UOW policy, procedures guidelines within their area of responsibility.

### 2.4 Deans and Directors of Units

Deans and directors are required to ensure that legislation and UOW guidelines relating to hazardous substances and work involving use of carcinogenic substances is implemented and that appropriate support and resources are provided.

### 3 Notification of Work Involving Use of Carcinogenic Substances

Any work that involves the handling and storing of prohibited and restricted carcinogens as referred to in Schedule 10 of the Workplace Health and Safety Regulation must be authorised by WorkCover. Authorisation must be obtained by applying in writing.

There are two types of listed carcinogens:

- Restricted carcinogens (Appendix 1) – are those chemicals that can be used once WorkCover has been notified;
- Prohibited carcinogens (Appendix 2) – are prohibited from use but can be used for limited research and analysis provided WorkCover is notified first.

Any local area planning to work with a listed carcinogen (listed in Appendix 1 or 2) must:

- Notify WorkCover NSW (at least 60 days before commencing the proposed work)
- Use the WorkCover [Application for the authorisation to use, handle or store prohibited and restricted carcinogens \(ACD\) form](#)
- Ensure the notification is renewed every five years
- Provide information to the supplier in order to buy or obtain the carcinogen.

When completing the application form the details of the duration that the worker will be exposed to the product must be listed in section 5 of the form under the purpose or activity for which the carcinogen will be used handled or stored.

A copy of the completed application and authorisation from WorkCover is to be sent to the [WHS Unit](#).

### 4 Statement of Exposure

Any worker or student who handles or stores prohibited or restricted carcinogens at the University will be provided with a written statement by their supervisor at the end of their employment or association with the university outlining the following:

- the name of the prohibited or restricted carcinogen which the worker may have been exposed to
- the time the worker may have been exposed
- how and where the worker may obtain records of the possible exposure
- whether the worker should undertake regular health assessments, and the relevant tests to undertake.

At the cessation of employment or association with the University, the worker or student will provide copies of the [Application for the authorisation to use, handle or store prohibited and restricted carcinogens \(ACD\) form](#) to verify the above points. The worker or student will be advised on the requirement to undertake regular health assessments based on the advice provided by WorkCover.

### 5 Records

A copy of the WorkCover notification form will be kept by the WHS Unit and filed on the Records Management System (RMS) as well as in a central database. The written authorisation provided by WorkCover is to be kept by the local area and a copy sent to the WHS Unit for addition to the Carcinogenic Substances Register. A copy will be placed on the person's personnel file or within RMS for students.

### 6 Risk Management

The implementation of these Guidelines utilises the risk management principle as outlined in the University's [WHS Risk Management Guidelines](#). The risk assessment principles that have been implemented in [Working With Hazardous Chemicals Guidelines](#) are to be adopted when working with carcinogenic substances.

## 6.1 Identifying hazards

All hazards associated with work involving the use of carcinogenic chemicals needs to be identified. Refer to the University's WHS Risk Management Guidelines for further information on processes and methods that can be utilised to identify hazards.

## 6.2 Risk Assessment

After all the hazards for the activity, process or equipment have been identified, the risk of each hazard needs to be assessed. Refer to the University's Risk Management Guidelines for more information on the risk assessment process.

## 6.3 Risk Controls

The [WHS Risk Management Guidelines](#), more specifically the hierarchy of controls, should be implemented where possible to eliminate hazards associated with carcinogenic substance.

Every effort must be made to use non-carcinogenic (or less toxic) chemicals in preference to carcinogenic (or highly toxic ones).

Exposure to carcinogenic or other highly toxic chemicals can occur by:

- Inhalation of dust or vapour;
- Absorption through the skin, eyes or wounds from contaminated clothing, spillage on benches, floors or from apparatus; and
- Ingestion from contaminated hands, utensils, drink or food.

All persons using carcinogenic chemicals should do so only with permission from the appropriate Manager, Head, Chief Investigator or Laboratory Supervisor. Personnel should be made aware of the potential hazard these chemicals pose to their health by consulting the Safety Data Sheet and completing a risk assessment prior to use.

Personnel should review the chemicals used in the laboratory to determine whether they include carcinogenic substances at least every six months. The review should also take into account existing safety precautions and update them as necessary.

A safe work procedure regarding the use, handling, storage and transport of individual carcinogenic or other highly toxic chemicals should be completed and approved by Dean or Director. The safe work procedure must comply with legislation, codes of practice and Australian Standards concerning the handling of carcinogens.

## 6.4 Training

Any person working with or handling carcinogenic chemicals should be provided with any information, instruction and training necessary to ensure their health and safety. Relevant information may include:

- the properties of the substance
- toxicity and/or reactivity
- precautions for safe use, e.g. segregation from incompatible materials
- procedures for handling, storage and transportation
- first aid and emergency
- engineering controls, e.g. ventilation
- personal protective equipment to be used.

## 6.5 Storage and Labelling

All carcinogenic, suspected carcinogenic or highly toxic chemicals should be stored:

- securely
- in screw-cap containers or ampoules
- at the appropriate temperature
- labelled clearly in accordance with the WorkCover Code of Practice for the Labelling of Workplace Substances.

Refer to the [Working With Hazardous Chemicals Guidelines](#) for more information.

## 6.6 Transport

If it is necessary to transport such chemicals within the laboratory the sealed container should be placed in a second unbreakable container to minimise accidental breakage or spillage.

## 6.7 Laboratory Safety

Specific requirements for working with carcinogenic chemicals include:

- hands must be washed thoroughly after using any such chemicals
- chemicals should be used only by persons involved in the experiment in specifically designed areas of the laboratory
- Doors into areas where carcinogenic chemicals are used should be marked distinctively to identify the nature of the hazard (e.g. CAUTION - LIMITED ACCESS. CARCINOGENIC CHEMICALS IN USE)
- Pipetting by mouth shall be strictly forbidden. Mechanical pipetting aids or disposable pipetting tips shall be used
- Working surfaces should be covered with an absorbent material backed with plastic and should be replaced at regular intervals or immediately a spillage occurs
- All experiments involving dust, vapour or aerosols of a carcinogenic nature shall be carried out in such a way as to ensure that no personal exposure occurs. In most cases a fume cupboard should be used which has been modified to contain a suitable filter and complies with AS2243.8: Safety in laboratories - Fume cupboards, and operated in accordance with the manufacturer's instructions
- A cytotoxic drug-handling cabinet which complies with AS2567: Laminar flow cytotoxic drug safety cabinets, should be used in cases where there is a need to maintain the sterility of the product
- Filters on ventilation and air-conditioning equipment, and such equipment as vacuum cleaners, in laboratories where carcinogenic substances are being used, may need to be changed by trained personnel more often than other filters
- Glove boxes should be kept under negative air pressure. Air changes should be adequate so that high concentrations of the vapours of volatile carcinogens will not occur.

Further information can be found in the [Laboratory Safety Guidelines](#).

## 6.8 Protective Equipment

Protective equipment should be chosen for its suitability to the task as well as the chemical and physical properties of the substance to be used, its volatility, stability, flammability, solubility and miscibility.

Protective equipment to be used when handling carcinogenic or highly toxic chemicals should include:

- rubber, PVC or polythene gloves, preferably disposable - these should be changed regularly so as to avoid impregnation
- buttoned or wrap-around laboratory coats
- laboratory safety glasses or, if there is a danger of liquids splashing, a full-face shield, and
- an approved respirator with a suitable particulate/vapour cartridge or an approved disposable face mask.

Protective equipment should:

- be stored adjacent to the work area
- be removed and stored before leaving the laboratory
- not be worn in rooms designated for eating and drinking
- be cleaned by appropriately qualified personnel.

## 6.9 Contamination

After using any carcinogenic or highly toxic chemical personnel should always rinse their hands well in cold water then wash them thoroughly with soap and hot water.

Contaminated laboratory glassware or equipment should be treated initially with chemicals or washed separately with solvents appropriate to the chemical in question. The glassware or equipment should then be rinsed in cold running water and washed and brushed in hot water and detergent before being assigned to any routine washing procedure.

Disposable laboratory equipment contaminated with carcinogenic or highly toxic chemicals shall be disposed of according to the [Waste Disposal Guidelines](#).

## 6.10 Monitoring

The laboratory supervisor must consider the need for, and as appropriate consult with respect to:

- monitoring the area in which carcinogenic or highly toxic chemicals are used (or the laboratory in general) to detect any decontamination of the air, benches, equipment, protective equipment or personnel, and
- biological monitoring or medical examination of personnel to detect any significant biological changes or effect on their health.

An inventory of carcinogenic or other highly toxic chemicals may be required by institutional or government authorities. An inventory should indicate the quantity of carcinogen(s) and date of acquisition. A record should be kept for each chemical of the user's name, the date and the quantity taken.

## 6.11 Disposal

The Laboratory Supervisor should be familiar with the methods required to neutralise, destroy or safely dispose of carcinogenic or highly toxic chemicals or materials contaminated by them. Carcinogenic or highly toxic chemicals should not be disposed of down the drains or into the atmosphere. Waste liquids containing carcinogenic or highly toxic chemicals should be placed or collected in proper containers for disposal.

Contaminated waste shall be disposed of according to the [Waste Disposal Guidelines](#).

## 6.12 Emergency Procedures

All persons in the laboratory should be evacuated immediately if there is a significant spill of a carcinogenic or highly toxic chemical (particularly if it is volatile), or if a fire or explosion occurs.

Any emergency should be managed in accordance with [Emergency Management Procedures](#).

## 7 Notification of Incidents

Incidents involving carcinogens are required to be reported to WorkCover. Contact the WHS Unit for further information. At minimum a SafetyNet Hazard and Incident Report will be required to be completed.

## 8 Health Surveillance

Guidelines around health surveillance for carcinogenic substances can be found in the [Air and Health Monitoring Guidelines](#).

## 9 Program Evaluation

In order to ensure that these guidelines continue to effective and applicable to the University, the program will be reviewed triennially by the WHS Unit and relevant stakeholders. Conditions which might warrant a review of the guidelines on a more frequent basis would include:

- An injury or near miss resulting from a hazardous substances
- Changes to legislation
- Employee concern.

Following completion of any review, the program will be revised/updated in order to correct any deficiencies. Any changes to the program will be consulted through the WHS Committee.

## 10 Related Documents

- NSW WHS Regulation 2011
- Guide for Notifications for Work Involving Carcinogenic Substances [WorkCover 2009]
- AS/NZS 2243.2 Safety in Laboratories - Chemical Aspects
- AS/NZS 2243.8 Safety in Laboratories - Fume Cupboards
- AS 2567-2002 Laminar Flow Cytotoxic Drug Safety Cabinets
- [Working With Hazardous Chemicals Guidelines](#)

- [Laboratory Safety Guidelines](#)
- [WHS Risk Management Guidelines](#)
- [Asbestos Management Plan](#)

## 11 Version Control

Version Control	Date Released	Approved By	Amendment
1	October 1996	WHS Manager	Document created.
2	January 2003	WHS Manager	Modification to reflect current process.
3	April 2008	WHS Manager	Review to incorporate WorkCover guidelines 4073 (May 2007).
4	August 2010	WHS Manager	Document updated to incorporate the Personnel name change to Human Resources Division.
5	April 2011	WHS Manager	Scheduled review incorporating 2009 WorkCover Guide for Notifications for Work Involving Carcinogenic Substances.
6	March 2012	WHS Manager	Rebrand.
7	July 2012	WHS Manager	Updated in line with WHS legislation.
8	April 2015	WHS Manager	Updated document to include 'Statement of Exposure' link. Updated document titles and links. Minor formatting.

## 12 Appendix 1 - Prohibited Carcinogens

Chemical Name	CAS No
2-Acetylaminofluorene	53-96-3
Aflatoxins – except in foods where specifically permitted under the Food Act 1989	-
4-Aminodiphenyl	92-67-1
Benzidine and its salts (including benzidine dihydrochloride [531-85-1])	92-87-5
Bis(Chloromethyl)ether	542-88-1
Chloromethyl methyl ether (technical grade which contains bis(chloromethyl) ether)	107-30-2
4-Dimethylaminoazobenzene (Dimethyl Yellow)	60-11-7
2-Napthylamine and its salts	91-59-8
4-Nitrodiphenyl	92-93-3

## 13 Appendix 2 - Restricted Carcinogens

Chemical Name and Restricted Use	CAS No
Acrylonitrile - All	107-13-1
Benzene – when used as a feedstock containing more than 50% of benzene by volume. Or for genuine research or analysis.	71-43-2
Cyclophosphamide (cytotoxic drug) – when used in preparations for therapeutic use in hospitals and oncological treatment facilities, and in manufacturing operations. Or for genuine research or analysis.	50-18-0
3,3'-Dichlorobenzidine and its salts (including 3,3'-Dichlorobenzidine dihydrochloride [612-83-9]) - All	91-94-1
Diethyl sulphate - All	64-67-5
Dimethyl sulphate - All	77-78-1
Ethylene dibromide – when used as a fumigant. Or for genuine research or analysis.	106-93-4
4,4'-Methylene bis(2-chloroaniline) - MOCA - All	101-14-4
3-Propiolactone (Beta-propiolactone) - All	57-57-8
o-Toluidine - All	95-53-4
o-Toluidine hydrochloride - All	636-21-5
Vinyl chloride monomer - All	75-01-4