Working Safely with Carcinogens Guideline

Section 1 - Purpose and Objectives

(1) The purpose of this Guideline is to create an awareness of the hazards associated with the handling of carcinogens and how exposure to them can be safely managed in the workplace. In conjunction with the Carcinogen Use, Handling and Storage Procedure, this Guideline should be referred to by all areas in The University of Queensland (UQ) where carcinogens are used, stored and disposed of, and incorporated into induction and training programs for UQ workers that use carcinogens in their research.

(2) This Guideline can also be applied to the use of other materials with high toxicity, such as mutagens, teratogens or cytotoxic drugs. The Health, Safety and Wellness Division (HSW Division) and local health, safety and wellness staff may be consulted for further advice on this Guideline and the implementation of the Carcinogen Use, Handling and Storage Procedure.

(3) This document provides guidance on the life-cycle of safely working with carcinogens from handling through to disposal and should be read in conjunction with the Australian Standards for Safety in Laboratories (AS2243:1-10) and other documents identified in this Guideline.

Section 2 - Handling of Carcinogens

(4) The use of carcinogens must be assessed following sound risk assessment practices and applying the hierarchy of controls. Where possible, every effort must be made to use non-carcinogenic (or less toxic) substances in preference to carcinogenic (or highly toxic) substances. When using carcinogens, the ALARA (As Low As Reasonably Achievable) principle should be adopted.

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

a. inhalation of dust or vapour;
b. absorption through the skin from contaminated clothing, spillage on benches, floors or from apparatus;
c. puncture of the skin; and
d. ingestion from contaminated hands or food, or smoking.

(6) To minimise exposure, the following work practices must be followed:

a. No food or drink are to be taken into, prepared or consumed where carcinogenic or highly toxic chemicals are used or stored.
b. Hands must be washed immediately upon completing a procedure where a carcinogen has been used and when leaving the work area. Immediately after skin contact or emergency exposure to a carcinogen, wash or, if appropriate, shower the affected area.
c. Pipetting by mouth is strictly forbidden. Mechanical pipetting aids or disposable pipetting tips should be used.
d. Do not attempt to recap or cut used needles. Use single use retractable syringe or blunt needles. Dispose the entire needle and syringe in a sharps container for disposal as hazardous waste.
e. Warning signs should be located on the door of the work area where carcinogens are used (e.g. Caution –

Authorised access only. Carcinogens in use.).

f. Carcinogens should be dispensed from the location at which they are stored. The amount taken should be no more than is immediately required and the aliquots should be labelled with a carcinogen warning and the name of the substance.
g. Working surfaces should be covered with an absorbent material backed with plastic and should be replaced at regular intervals or immediately when a spill occurs.
h. All experiments involving dust, vapour or aerosols of a carcinogenic nature should be carried out in a high efficiency-maintained fume cupboard. Laminar flow cabinets do not protect the worker from exposure to the carcinogen and should not be used for this purpose.
i. Regular housekeeping of bench areas should be performed to prevent contamination from spreading to other areas within the workspace. Special clean-up procedures for spilled carcinogens are described further in the document and should be considered prior to using a chemical.

Section 3 - Safety Data Sheets (SDS)

(7) Safety Data Sheets (SDS) are required to be kept for all hazardous substances used at the workplace, in accordance with the Work Health and Safety Regulation 2011, and they may be obtained from the supplier or through a central source, such as Chemwatch. Access to the SDS should be readily available for perusal for the purposes of risk assessment, manufacturer and product identification, health effects, precautions for use, correct storage, and emergency and first aid procedures. If the SDS for the carcinogen is not readily available, a copy should be obtained from the manufacturer and stored prior to commencing work with the substance.

(8) A chemical that has been classified as a carcinogen under the Globally Harmonised System (GHS) must display the health hazard pictogram, and the hazard statements associated with the carcinogen classification.

(9) The GHS classification elements that are on the labels and SDS of carcinogens are shown in the linked diagram below:

> See diagram: Figure 1 - Globally Harmonised System Classification Elements on Labels and SDS of Carcinogens.
>
> Source: Safe Work Australia – Carcinogens.

(10) If the person using the carcinogen has an adverse exposure to the substance, a copy of the SDS should be transported with them to their medical practitioner or UQ Health Care to aid in the correct treatment.

Section 4 - Signage, Labelling and Storage

(11) Designated areas (e.g. an entire laboratory, an area of a laboratory, or a piece of equipment such as a fume-cupboard) should be identified where carcinogens are used or are to be used. Doors into areas where carcinogens are used should be marked to identify the nature of the hazard (e.g. Caution – Authorised access only).

(12) All carcinogenic, suspected carcinogenic or highly toxic chemicals should be stored in screw-cap containers or ampoules at the appropriate temperature and clearly labelled with the chemical composition, date of preparation and the nature of the hazard (e.g. Carcinogen – Handle with care, Danger – Carcinogen). Only open the carcinogen stored in the screw cap container in a fume cupboard. Carcinogens should be packaged to withstand shocks, pressure changes, and any other conditions that may cause leakage of contents.

(13) These materials should be stored in designated areas, cabinets, or refrigerators within the primary work or

storage area, with consideration given to incompatibilities with other substances. The SDS provides information on incompatibilities of classes of chemicals. Precautions should be taken to protect from rodents, weather, incompatible chemicals, and spillage. Additional storage requirements (e.g. use of double containers) may be necessary for certain highly potent carcinogens with physical properties that enhance spontaneous release and exposure (e.g. highly dispersible powders or volatile solids).

(14) Restricted and prohibited carcinogens must be locked to prevent unauthorised access (refer to the Carcinogen Use, Handling and Storage Procedure) and signage in Restricted Carcinogen in Use - Form D displayed within the work area and/or storage area.

(15) An inventory of chemicals must be maintained where carcinogens are stored in the workplace.

Section 5 - Risk Assessment

(16) The Work Health and Safety Regulation 2011 requires that prior to a hazardous substance being used, a risk assessment must be conducted. Once the proposed use of a carcinogen has been identified, a risk assessment of the overall work task must be performed to determine the appropriate safety requirements – refer to the Health and Safety Risk Management Procedure.

(17) The process of risk management for chemicals involves the four steps shown in the following diagram – the four steps are undertaken in a cyclic manner until an acceptable level of risk is achieved. There is a fifth step which is to evaluate that no new risks have been introduced by implementing the control measures or a by-product of the chemical process or task is not a carcinogen.

> See diagram: Figure 2 - Process of Risk Management for Chemicals.
>
> Source: Workplace Health and Safety Queensland (WorkSafe Qld) – How to Manage Work Health and Safety Risks Code of Practice 2021.

(18) An evaluation of the risk associated with the hazard is necessary to determine if the risk is significant, in which case additional or improved measures will be required to control (prevent or minimise) exposure to the hazard. In addition, in determining the level of significance of the risk, the risk assessment process serves to facilitate the decisions required for appropriate controls, training, monitoring and health surveillance.

(19) Factors such as the type of carcinogen, its innate carcinogenic potency, physical and chemical properties, potential route(s) of exposure, duration of exposure, quantities handled, controls currently in place and their efficiency, and the specific process involved needs to be assessed. All risk assessments must be completed in UQSafe. Once the risks are assessed and mitigated, a safe operating procedure (SOP) for the task may be developed. All persons using the carcinogen and undertaking the specific task must be made aware of the risk assessment, the SOP and undergo any training required by the Group Leader, Chief Investigator or Supervisor. Personal protective equipment (PPE) should be provided to all users undertaking the task as detailed in the risk assessment and training provided in the correct use, storage and disposal of the PPE.

Section 6 - Induction and Training

(20) UQ workers using carcinogens must be aware of the health hazards that the carcinogen may present and be given induction and training (including refresher training) prior to using the carcinogen. The induction should include the following:

a. Nature of the hazards and properties of the carcinogen to which UQ workers may be exposed, including routes

of entry into the body and potential health risks.

b. Safe work practices to be followed when using, handling, storing, cleaning up and disposing of the carcinogen, including training in the proper use, fitting and maintenance of personal protective equipment (PPE).
c. Instructions on correct labelling of carcinogens and other chemical hazards.
d. Locating and using safety data sheet (SDS) using Chemwatch, and interpreting current SDS information.
e. Measures used to control exposure to the carcinogen including the correct use and maintenance of these controls (e.g. fume cupboard, Class II Biosafety cabinet, cytotoxic cabinet, PPE, clear signage and notices).
f. Emergency procedures, including evacuation, special decontamination procedures and post exposure procedures.
g. First aid and incident reporting procedures in the case of exposure, injury or illness.
h. Health surveillance and air monitoring (if required), type of methods used and how to obtain the results from any health surveillance or air monitoring conducted.

(21) The training should be practically based and include the following:

a. How the carcinogen can affect the workers' health (e.g. exposure route) by interpreting the relevant SDS.
b. How to safely perform the task with the carcinogen, through implementing the correct controls, as per risk assessment, and following the correct procedure to avoid exposure.
c. How to select the appropriate PPE, correctly use it, have it fit tested if required and its maintenance.
d. How to store, clean up and dispose of the carcinogen and contaminated material appropriately.
e. How to respond in an emergency.
f. How to report a near miss, incident or potential exposure using UQSafe.

Section 7 - Transporting Carcinogens

(22) If it is necessary to transport carcinogenic, suspected carcinogenic or highly toxic chemicals within the laboratory, the building or across campus, the sealed container should be placed in a second unbreakable container to minimise the risk of accidental breakage or spillage. This secondary container should have the appropriate dangerous goods labelling accompanied by a name and contact phone number (refer to the Chemical Labelling Guideline).

Section 8 - Disposal

(23) Before beginning a laboratory activity that involves a carcinogen, plans should be developed for the handling and disposal of contaminated wastes and surplus carcinogens. Users should properly segregate, package and label all solid and liquid wastes contaminated with carcinogens. Under no circumstance should carcinogenic or highly toxic chemicals be disposed of down drains or into the atmosphere.

(24) Chemical waste disposal containers or labels for appropriate containers must be requested from the UQ Science Store using the Chemical Waste Container Request form. These containers are labelled and barcoded to properly identify the chemical waste, especially if it includes carcinogens, they are stored in a secured area or in a locked chemical waste cupboard, as per the University Chemical Waste Operating Procedure. Full waste containers are collected by the university waste disposal contractor.

(25) Cytotoxic waste must be disposed of using the purple cytotoxic bins in accordance with the University Environmental Management System procedure.

Section 9 - Emergency Procedures

(26) Before commencing an activity that involves a carcinogen, plans should be developed for emergency response to spills, exposures or incidents. General guidance for emergency planning includes developing procedures for:

a. evacuating the area;
b. restricting access to the area
c. providing care to injured or exposed personnel;
d. showering or washing;
e. obtaining medical attention immediately;
f. decontaminating the area.

(27) Suitable PPE should be worn and, if necessary, self-contained breathing apparatus equipment used. The latter should only be worn by people trained in its use.

(28) Personal or significant laboratory contamination should be reported to the laboratory supervisor immediately. An incident report should be completed in UQSafe as soon as possible after the incident has occurred. The report should include the date of spillage, names of persons exposed, carcinogen spilt, quantity and clean-up procedures employed. An incident investigation should be undertaken by the supervisor in conjunction with the Work Health and Safety Coordinator (WHSC) and/or the Health, Safety and Wellness Manager (HSW Manager) of the Faculty or Institute.

Section 10 - Decontamination

(29) The following decontamination procedures should be followed to prevent spreading of carcinogens within the workplace:

a. After using any carcinogenic or highly toxic chemical, users should always rinse their hands well in cold water then wash them thoroughly with soap and hot water.
b. Contaminated glassware or equipment should be neutralised with chemicals or washed separately with solvents appropriate for the chemical. The glassware or equipment should then be rinsed in cold running water then washed and scrubbed in hot water with detergent before being assigned to any routine washing procedure.
c. Contaminated benches should be wiped down with cold water followed by hot water and detergent. Similarly, all benches where a carcinogenic or highly toxic chemical has been used should be cleaned regularly, irrespective of known contamination.
d. It is essential that an effective system is in operation for the cleaning of personal protective equipment and for the laundering of laboratory coats – refer to the Personal Protective Equipment Procedure.
e. Prior to maintenance work being conducted in the area or upon any piece of equipment, all work should cease and the area and equipment be decontaminated, including vacuum pumps. Particular care should be taken to avoid contamination of drains and ventilation ducts.
f. Cytotoxic drug cabinets, biosafety cabinets class II, glove boxes, and other specialised equipment, decontamination requiring the removal and disposal of HEPA filters should be carried out only by specially trained personnel (Properties and Facilities approved contractors).

(30) Procedures for the chemical destruction of carcinogens are in the Appendix at section 14 (under ‘Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes’).

Section 11 - Ventilation Requirements

(31) Ventilation for controlling exposure to carcinogens may include a combination of the facility features and engineering controls listed below:

a. negative pressure of the workplace relative to common areas (e.g. corridors and offices);
b. filters, traps and scrubbers on air, vacuum and ventilation piping;
c. chemical fume hoods, glove boxes, closed systems and other isolation devices;
d. non-permeable work surfaces;
e. secondary containment trays.

(32) Laboratory fume cupboards are designed to provide protection for the user from chemical contaminants which are used inside the cupboard. Use of carcinogenic or highly toxic chemicals should occur in the fume cupboard, not on an open bench. It should be noted that though fume cupboards are designed to protect the user from the hazardous substances being used, fume cupboards do not eliminate exposure completely even under ideal conditions. Careless work practices may cause considerable exposure to a user who may believe they are protected. To optimise the performance of the fume cupboard, the following work practices should be adhered to:

a. Ensure that the fume cupboard has a current inspection sticker (dated within 6 months). If the face velocity of the fume cupboard has failed the inspection, work involving carcinogens should not commence until the fume cupboard exhaust system is repaired.
b. Utilise the cupboard with the sash positioned as low as possible (usually 45cm in height). This will ensure adequate face velocity and allow the sash to act as a protective shield. Keep cupboard sashes down to an opening of about 15cm when the hood is not in use to conserve energy in variable air volume systems.
c. The fume cupboard is not a storage cabinet. Significant quantities of chemicals should not be stored within the cupboard as these materials can obstruct the air flow or exacerbate an incident or emergency in the cupboard. However, minor quantities of waste or highly toxic chemicals may be stored within the fume cupboard, as this may be safer than storing on the open bench. Highly hazardous chemicals should not be stored in fume cupboards in which high hazard processes are being undertaken (e.g. heating, pressurised equipment etc.).

(33) The degree to which these controls should be applied depends on the safety level of the operation.

a. Use of solid materials may not require a ventilated enclosure, but highly volatile chemicals or those that generate aerosols or dusts should be conducted in a ventilated enclosure or with a local exhaust system above the process.
b. Analytical instruments that produce vapours or aerosols should be connected to a mechanical exhaust system when used with carcinogens. ‘Ductless’ hoods should not be used for carcinogens.

(34) Glove boxes are also used for handling highly toxic substances. Glove boxes are operated under negative pressure using a pump or exhaust fan arrangement. The exit gases should be trapped or filtered through a HEPA filter and then released into the hood exhaust. Glove box exhausts must not be vented into the general laboratory.

(35) A cytotoxic drug safety cabinet is used where a sterile environment is required for the product being worked with, but PPE is also required. A typical example of when these cabinets are used is during the weighing out of cytotoxic drugs in a hospital pharmacy. Cytotoxic Drug Safety Cabinets should be installed and used in accordance with AS 2639:1994.

Section 12 - Personal Protective Equipment (PPE)

(36) A risk assessment of the process and a review of the SDS will indicate which control measures are required to minimise exposure to workers. When minimising exposure to occupational hazards the hierarchy of controls must be followed, e.g. controls ranging from elimination and substitution of the hazard (most desirable), through to administration controls and personal protective equipment (least desirable).

(37) Ideally, personal protective equipment (PPE) should only be considered to complement other control measures. When used, PPE should be chosen for its suitability to the task (e.g. comfort, enables dexterity of movement), as well as its compatibility with the chemical and physical properties of the substance to be used, e.g. its volatility, stability, flammability, solubility and miscibility.

(38) When working with hazardous chemicals, the minimum laboratory attire that must be worn is laboratory coat, safety glasses and closed footwear. Additional protective equipment may be required in certain cases - the risk assessment must be consulted and also the area WHSC or HSW Manager.

(39) When handling carcinogenic chemicals, the chemical resistance guide for glove materials should be used to determine the best type of glove for the carcinogen being handled. Gloves should be inspected before each use, cleaned and replaced periodically if not disposable.

(40) PPE should be stored adjacent to the work area and should not be taken to other areas of the laboratory. Laboratory coats, in particular, should be removed and stored before leaving the laboratory and should not be worn in rooms designated for eating and drinking. Protective clothing (e.g. lab coats) should be cleaned by an industrial laundry rather than being taken home by the wearer. In situations where significant contamination has occurred, equipment should be disposed of or decontaminated prior to cleaning. For the purposes of cleaning and maintaining PPE, there should be a training program in place, especially if such equipment is re-useable. If possible, protective equipment should be designed and used for operations involving carcinogen handling alone.

Section 13 - Work with Animals and Animal Facilities

(41) The following work practices should be followed for the use of carcinogens in animal experiments:

a. Compliance with relevant legislation and Code of Practices
   All experiments involving animals must be carried out in accordance with the National Health and Medical Research Council (NHMRC) publication, Australian Code for the Care and Use of Animals for Scientific Purposes (8th edition, 2013). In addition, Chief Investigators and Group Leaders must ensure compliance with relevant federal or state legislation regarding the use of experimental animals. Such compliance at UQ will include written approval of the UQ Animal Ethics Committee.
b. Isolation of animal(s)
   Animals treated with carcinogenic or other highly toxic chemicals (e.g., cytotoxic drugs) should be isolated and housed in such a manner that other experimental animals will not be contaminated. The species may govern the appropriate means of containment. For large animals (e.g., sheep or other livestock), this may best be achieved by keeping animals in a separate room.
c. Cages
   These should be clearly labelled indicating the animal ethics approval, a carcinogen hazard warning label and the carcinogen in use.
d. Biological activity of substance
   Special consideration should be given to the method of administering such chemicals or compounds of unknown biological activity. Volatile chemicals represent the greatest risk through inhalation and should be administered

by injection of a solution.

e. Topical application
   Administration by topical application, gavage or intra-tracheal instillation should be performed in a fume cupboard or Class II Biosafety cabinet (preferably a cytotoxic cabinet). This will only be appropriate for small to medium sized animals. Where the size of the animal makes the use of a fume cupboard or Class II Biosafety cabinet impractical, the area must be adequately ventilated and PPE worn. If the chemical used is likely to be exhaled, the animal should be kept under the fume cupboard or Class II Biosafety cabinet during this period. Ideally, purpose-built exposure chambers with known tolerances should be used. Such tolerances should principally include the resistance of the chamber to chemicals (solvents, etc.) and the maximum tolerated pressure. Exposure chambers not within this category should be set up inside a fume cupboard or Class II Biosafety cabinet.

f. Food and water
   Administration of volatile chemicals to animals in their food and water is very difficult to perform without contaminating cages and other equipment. Therefore, unless specifically required, methods or administration other than in diet should be used. Mixing of carcinogenic or highly toxic chemicals in diet should be carried out in sealed mixers in a fume cupboard. Special protective clothing and respiratory protection may be required when mixing diets.

g. Animal waste
   The risk from excreta-contaminated animal bedding or residual food can be reduced by either:
   i. using heavy adsorbent paper rather than sawdust in cages of open-tray bedding; or
   ii. using individually ventilated cages (IVC) (closed design).

h. Waste disposal
   Carcasses of laboratory animals, cage litter and miscellaneous solid wastes that are known to be contaminated or which could be contaminated should be double bagged, labelled clearly and stored whilst awaiting disposal. This includes disposable protective clothing, gloves, shoe covers, plastic-backed absorbent paper, residues from the clean-up of carcinogenic chemical spills, and exhaust air filters. Autoclaving of waste material will not disperse or neutralise carcinogens and can present a hazard to staff operating the autoclave. Carcinogenic substances will need to be removed from the surface of cages before autoclaving. Any task with waste that generate particulate, such as knocking out dirty cage bedding, should be completed inside a fume cupboard or Class II Biosafety cabinet.

i. Information and education
   All staff who are likely to work near or in the area holding the animal(s) used in the experiments using carcinogens must be informed of the experiment, potential hazards and safety precautions to be implemented in the handling of the animals, disposal of waste, action to be taken in the event of an accidental spill of carcinogen or exposure to the substance. If appropriate, staff must be informed of the different hazards associated with the substance (e.g. atmospheric contaminant such as formaldehyde or an anti-neoplastic agent such as procarbazine). Those responsible for the daily management of an animal facility are to be advised of the experimental substance so appropriate precautions can be implemented, as they are managing multitude of projects with a variety of hazardous substances and their risk might be increased.

j. PPE
   When staff or students are performing any task involving carcinogenic substances (preparation of substance, feeding or watering animals, cleaning of cages and disposing of animal waste), they should wear as a minimum:
   i. a long-sleeved gown with closed front and elasticised cuffs or overalls;
   ii. safety spectacles with side shields, goggles or full-face shield; and
   iii. gloves which are specific to the chemical being handled.

Section 14 - Appendix

Definitions

Term	Definition
Carcinogen	A substance that causes cancer: malignant growth or tumour resulting from an uncontrolled division of cells in any part of the body in humans or animals. Most carcinogens are chronic toxins with long latency periods that can cause damage after repeated or long duration exposures and often do not have immediate apparent harmful effects. A carcinogen is considered to be “occupational” if there is significant human exposure to the agent in the workplace, in terms of either prevalence or level of exposure.
Exposure	A situation or condition that makes someone likely to be harmed, especially because the person has not been protected from something dangerous.
Decontamination	The neutralization or removal of dangerous substances from an area, object, or person.

Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes

(42) Decontamination procedures vary depending on the material being handled; consult the SDS. The toxicity of some materials can be neutralized with other reagents. All surfaces should be wiped with the appropriate cleaning agent following dispensing or handling. The following methods of decontamination and destruction of carcinogens in laboratory wastes are based on procedures published by the International Agency for Research on Cancer (IARC).

(43) Organic compounds, including carcinogens, can be destroyed by sodium dichromate in a strong solution of sulphuric acid. One to two days is generally considered sufficient time for the destruction of chemicals when a freshly prepared reagent is used. By then all material should have dissolved in the reagent and can be rinsed away with water.

(44) Carcinogens that oxidise readily can be destroyed with milder agents such as saturated solution of potassium permanganate in acetone. This solution is suitable for the destruction of hydrazines or compounds containing isolated carbon-carbon double bonds. Concentrated or 50 per cent aqueous sodium hypochlorite can also be used as an oxidising agent.

(45) Carcinogens that are alkylating, arylating or acrylating agents can be destroyed by reaction with nucleophiles such as water, hydroxyl ions, ammonia, thiols and thiosulfate. The reaction of alkylating agents varies greatly, however, and is influenced by the solubility in the reaction medium. The complete reaction can be facilitated by dissolving the agents in ethanol or similar solvents.

(46) Methyl methanesulfonate and ethyl methanesulfonate are moderately soluble in water and can be destroyed in 10% thiosulfate solution. Special care should be taken, however, when gram or greater quantities of these compounds and other highly reactive reagents have to be destroyed. Large volumes of aqueous bicarbonate solutions are recommended in preference to 10% thiosulfate solutions which may cause violent reactions.

(47) Ethyleneimine and its derivatives can be destroyed by acid-catalysed hydrolysis or by thiosulfate buffered to pH 5.

(48) Cyclophosphamide can be destroyed by potassium hydroxide in methanol.

(49) N-Methyl-N’-nitro-N-nitrosoguanidine (MNNG) is slowly hydrolysed in water but is rapidly destroyed by 10% thiosulfate solution. The treatment of MMNG and related nitrosamides, such as N-nitrosomethyl-and N-nitrosoethylurea, with alkali should be avoided or carried out with extreme care because of the toxic gaseous diazomethane produced.

(50) N-Nitrosodimethylamine can be destroyed by dichromate-sulphuric acid; it may also be reduced by e.g. zinc powder and acetic acid or by caustic soda and aluminium to the carcinogen, demethylhydrazine, which in turn has to be oxidised (e.g. using a permanganate solution). Nitrosamines also can be split into nitrites and amines by hydrobromic acid and acetic acid. Effective destruction of N-nitrosamines at levels below 500ppm may be achieved by hydrochloric acid and hydrobromic acid.

(51) Polycyclic aromatic hydrocarbons (PAH's), such as benz[a]pyrene, can be oxidised readily by adichromate-sulphuric acid mixture.

(52) Aflatoxins can be degraded by adding hypochlorite solution to the material to be decontaminated, followed by acetone to destroy any 2,3-dichloro aflatoxin B1 which may have been formed.

(53) Aromatic amines can only be destroyed by high temperature incineration. Refer to the Chemical Waste Operating Procedure.

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