

## Chemical Spill Response Guideline

Despite the best efforts of researchers to practice safe science in the laboratory, accidents resulting in the release of chemicals will occur. For this reason, it is essential that all laboratory personnel have a spill response plan that includes appropriate procedures and materials to adequately contain and clean up a chemical spill. The following procedures should be used as a guide to help laboratory personnel design an effective spill control plan for their laboratory. These procedures tell you how to prepare your own spill kit and give you step-by-step instructions for spill cleanup. They also outline when and who to call for assistance.

### Spill Response Procedures - Major Spill

In the event of a spill which:

- Involves the release of a type or quantity of a chemical that poses an immediate risk to health; or
- Involves an uncontrolled fire or explosion:
  - 1) Evacuate the building by activating the nearest fire alarm.
  - 2) Call 53333 and give details of the accident including location, types of hazardous materials involved, and whether there is personal injury.
  - 3) If the accident involves personal injury or chemical contamination, follow the above steps as appropriate and at the same time:
  - 4) Move the victim from the immediate area of fire, explosion, or spill (if this can be done without further injury to the victim or you).
  - 5) Locate nearest emergency eyewash or safety shower. Remove any contaminated clothing from the victim and flush all areas of the body contacted by chemicals with copious amounts of water for 15minutes.
  - 6) Administer first aid as appropriate and seek medical attention.

### Spill Response Procedure - Minor Spill

In the event of a spill involving the release of a type or quantity of a chemical which does not pose an immediate risk to health and does not involve chemical contamination to the body:

- 1) Notify lab personnel and neighbours of the accident.
- 2) Isolate the area. Close lab doors and evacuate the immediate area if necessary.
- 3) Remove ignition sources and unplug nearby electrical equipment.
- 4) Establish exhaust ventilation. Vent vapours to outside of building only (open windows and turn on fume hoods).
- 5) Locate spill kit.
- 6) Choose appropriate PPE (goggles, face shield, impervious gloves, lab coat, apron, etc.)

- 7) Confine and contain spill.
- 8) Acid and base spills should be neutralized prior to cleanup. Cover with appropriate absorbent material.
- 9) Sweep solid material into a plastic dust pan and place in a sealed container.
- 10) Wet mop spill area. Be sure to decontaminate broom, dustpan, etc.
- 11) Put all contaminated items (gloves, clothing, etc.) into a sealed container or plastic bag.
- 12) Return spill kit to storage location and arrange for used contents to be replaced.
- 13) Inform the Laboratory Manager.

## Spill response procedure – greater than 2.5L, very toxic or a fire hazard

**Contact immediately:** OH&S Unit 336 52365 and University Security on 336 53333 and follow one of the procedures listed above.

## Spills requiring special procedures

### Bromine

- Neutralize spill with a 5% solution of sodium thiosulfate.
- Absorb with inert absorbent material

### Hydrofluoric Acid

- Do Not use water
- See special emergency treatment instructions (located above the fume hood and in first aid kit)
- For spills of any amount of concentrated HF or buffered HF outside of a fume hood ***EVACUATE LABORATORY AND CALL 53333 FOR UQ SECURITY ASSISTANCE***
- Neutralize with soda ash or lime (or absorb spill with special HF spill pillow).

Absorb with inert absorbent material

### Mercury

- Use a special mercury spill kit
- Use aspirator bulb or suction device to collect mercury beads (DO NOT USE VACUUM CLEANER).
- Mop up mercury with mercury decontaminating powder.
- Contact the Occupational Hygiene Advisers and ask for assistance if you are unable to accomplish adequate clean up.
- Label waste with a Hazardous Chemical Waste Tag and inform Marshall Butterworth (51418) that the sealed waste container needs to be picked up and disposed of.

### Acid and caustic spills (Do not use for HF)

- Ensure you are wearing appropriate protective clothing (goggles, gloves and shoes, respirator)
- Ensure area is well ventilated
- Neutralise and absorb spill e.g. sodium bicarbonate
- Scoop up waste in plastic waste bags
- Mop floors after clean-up

## Alkali Metals (lithium, sodium, magnesium, potassium)

- Smother with dry sand or cover with contents from a Class “D” fire extinguisher. Use of a Class “D” fire extinguisher is the preferred extinguishing method.
- Avoid contact with water.

## Chemical spill kit contents

Every laboratory that uses chemicals must have access to a spill control kit. The keys to an effective spill kit are location and content. Spill kits should be strategically located around work areas in fixed locations so they will be easily accessible. Although most spill kit contents are common items which may be found throughout the lab, they must be consolidated for emergency use.

Spill kits can be purchased through most supply vendors that sell chemicals or safety supplies.

The following is a list of recommended items that should be contained in a chemical spill kit. However, it is important that spill kits be tailored to meet the specific spill control needs of each laboratory. Spill kits should be checked periodically, and restored after each use.

### Absorbents:

- Universal Spill Absorbent - 1:1:1 mixture of Flor-Dri (or unscented kitty litter), sodium bicarbonate, and sand. This all purpose absorbent is good for most chemical spills including solvents, acids (not good for hydrofluoric acid), and bases.
- Acid Spill Neutralizer - sodium bicarbonate, sodium carbonate, or calcium carbonate.
- Alkali (Base) Neutralizer - sodium bisulfate.
- Solvents/Organic Liquid Absorbent - Inert absorbents such as vermiculite, clay, sand, Flor-Dri, and Oil-Dri.
- Bromine Neutralizer - 5% solution of sodium thiosulfate and inert absorbent.
- Hydrofluoric Acid - HF compatible spill pillow or neutralize with lime and transfer to a polyethylene container.

## Personal Protective Equipment (PPE)

- Goggles and Face Shield
- Heavy Neoprene Gloves
- Disposable Lab Coat and Corrosive Apron
- Plastic Vinyl Booties
- Dust Mask/Respirator (All lab personnel must be properly fit tested before using a respirator.)

## Clean-Up Material

- Plastic Dust Pan and Scoop
- Plastic Bags (30 Gallon, 3 mil thickness) for contaminated PPE
- One Plastic Bucket (5 gallon polyethylene) with lid for spill and absorbent residues

## Other

- Hydrofluoric Acid Antidote Gel - Calcium Gluconate

- Mercury Spill Kit - Aspirator Bulb and Mercury Decontaminating Powder
- Alkali Metals - Dry sand or a Class “D” Fire Extinguisher
- Acid Chlorides - Oil Dri, Zorb-All, or dry sand

## **First Aid for Serious Chemical Splashes (Involving corrosive or toxic substances and/or large skin areas)**

### **For chemical splashes to the eye**

- FLOOD THE EYES WITH WATER FROM THE EMERGENCY EYE WASH
- Continue with running water for 20 minutes then seek medical attention from the University Health Service or ambulance

### **For chemical splashes to the skin –**

- FLOOD THE SKIN WITH WATER FROM THE EMERGENCY SHOWER
- Continue with running water for 20 minutes then seek medical attention from the University Health Service or ambulance

### **Delegate people to phone UQ Security 336 53333**

- Arrange easily located point to meet emergency team
- Delegate people to stay by the phone and meet emergency team
- Confirm site and meeting place with UQ Security
- Note: UQ Security will call an ambulance if required

### **Delegate people to obtain the MSDS**

- Follow the first aid instructions on MSDS
- Give a hard copy of MSDS to the University Health Service or ambulance

## **Complete an incident report using the On-Line Injury and Incident Report system**

## **First Aid for Chemical Splashes (Involving non-corrosive, non-toxic substances and/or small skin areas)**

### **For chemical splashes to the eye**

- FLOOD THE EYES WITH WATER FROM THE EMERGENCY EYE WASH
- Continue with running water for 20 minutes then seek medical attention from the University Health Service or other medical facility

### **For chemical splashes to the skin**

- Irrigate the skin with running water for 20 minutes then seek medical attention at the University Health Service or other medical facility

### **Delegate people to obtain the MSDS**

- Follow the first aid instructions on MSDS
- Give a hard copy of MSDS to the University Health Service or medical staff

Complete an incident report using the On-Line Injury and Incident Report system

## Special First Aid

**Hydrogen Fluoride and Hydrofluoric Acid (HF)**; require calcium gluconate gel, areas that use these substances must have HF specific first aid procedure – see <http://www.uq.edu.au/ohs/pdfs/alert-hydrofluoric.pdf> for more information

**Phenol and phenol compounds like Qiazol or Trizol** require glycerol, areas that use these substances must have Phenol specific first aid procedure – see <http://www.uq.edu.au/ohs/pdfs/phenolfirstaid.pdf> for more information