Chemical Safety

February 2020

Chemical Spillage Guidance

Occupational Health and Safety Service
HSD068C (rev 2)

UNIVERSITY OF CAMBRIDGE

Hazardous Chemical Spillage Guidance

1. Chemical Spill Response Action Plan:

It is essential to have a *'spillage action plan'* in order to safely deal with any chemical spill, be it liquid or solid.

NB: Chemicals which readily produce toxic fumes, are extremely toxic, or air reactive, or water reactive, or shock/friction sensitive etc. will need very special consideration beyond this guidance; with a significant emphasis on preventing spillage and mitigating its effects.

The *'spillage action plan'* should be considered and recorded as part of the hazardous substance risk assessment for the chemicals being used or stored and should include:

1.1 A review of Safety Data Sheets (SDSs) and/or other references for recommended spill clean-up methods and materials and the identification of any personal protective equipment (PPE) required. Followed by;

1.2 Acquiring sufficient quantities and appropriate types of spill control materials such as paper towels, absorbent granules/powders, pads, pillows or socks to contain any spills that can be reasonably anticipated. Where 'spill kits' are appropriate a variety of commercial kits are available from laboratory safety suppliers; some are 'universal', whilst others are for specific types of chemicals i.e. for 'acid absorbing/neutralising'. It may also be necessary to consider the need for equipment to disperse, collect and contain spill control materials (i.e., brushes and scoops (**NOT** vacuum cleaners) and sealable / labelled waste containers, etc).

1.3 Acquiring the PPE identified in the risk assessment and knowing where it is and how to use it properly. i.e. safety glasses (face shields?), suitable gloves*****, protective clothing / laboratory coats, safety shoes/boots and/or 'over shoes' and even a respirator/face mask** if applicable, etc.

1.4 Place spill control materials and PPE in a clean, secure and readily accessible location within or immediately adjacent to the laboratory.

***** Some chemicals damage certain types of glove material (degradation) whilst many organic liquids can permeate through many glove materials (permeation). Furthermore if broken glass / sharps are involved the gloves should be thick and robust to protect against it - see University guidance:

http://www.safety.admin.cam.ac.uk/publications/hsd059c-glove-selection-guidance

** The Control of Substances Hazardous to Health (COSHH) Regulations require that anyone using **ANY** respirator/face mask identified as a control measure should undergo 'face-fit testing' prior to its use to ensure that the respirator/face mask forms a close seal to their face.

NB: Disposable face masks only offer protection against dusts, **not** hazardous chemicals, whereas 'rubber' half and full face masks etc, if fitted properly and with the correct filter, can offer protection against chemicals for a limited period of time - see University guidance:

http://www.safety.admin.cam.ac.uk/publications/hsd009c-respiratory-protective-equipment-rpe-its-selection-and-use

Never enter a contaminated atmosphere without respiratory protection (a full face mask would be required to protect the eyes!), never use a respirator without training or without a second trained respirator wearer in communication or in sight, in case of an emergency.

If self-contained breathing apparatus is required, for instance in the presence of a reduced oxygen atmosphere or in the presence of extremely hazardous chemicals or very high levels of contamination, then the emergency services should be summoned (telephone 1-999 or 9-999).

2. Chemical Spill Response Procedure:

The chart below will **help** determine the appropriate response in the event of a liquid spill of a substance that is hazardous to health. However it should not be taken as absolute as some substances will be considerably more toxic, reactive and /or flammable than others, and a spill of a chemical in one location may represent a higher risk than the 'same spill' in

another location, **therefore each spill must be judged accordingly.**.

Category	Size	Response	Treatment Materials
Small	Less than **50ml**	Absorption or Chemical treatment	Paper towels, appropriate absorption spill kit and/or neutralization
Small to Medium	**50ml** to **250ml**	Absorption or Chemical treatment	Appropriate absorption spill kit and/or neutralization
Medium to Large	**250ml** to **2.5 litres**	Absorption	Appropriate absorption spill kit
Large	More than **2.5 litres**	Assess and notify DSO	Consider the need for outside help and ensure nothing can enter rainwater drains

Dependant on the size and nature of the spill (solid or liquid), the general procedure listed below should be followed:

2.1 If appropriate immediately alert others in the area and the area supervisor, consider the need to ventilate and if necessary evacuate and secure the area.

2.2 If the spillage/leakage is within an unopened or 'intact' parcel, can the parcel be safely moved 'outside' to a suitable place away from rainwater drains, before dealing with it. Alternatively would it be appropriate to move it into a fume cupboard before dealing with it. Secondary containment may be needed during transit to avoid contaminating the building.

2.3 If appropriate notify your Departmental Safety Officer (DSO) and/or seek advice from the University's Chemical Safety Adviser, telephone: 66353 or 766353 if 'off the network'.

2.4 In the event of having to evacuate the building telephone the University Security Office, telephone: **101** or 767444 the latter being for emergency calls 'off the network'.

2.5 **As quickly as possible attend to any persons who may have been contaminated by the spill and summon a University first aider if required.**

All those assisting must wear appropriate personal protective equipment to a minimum of eye protection, a laboratory coat and suitable gloves.

Contaminated clothing must be removed immediately, where necessary cutting clothing away with first aid scissors rather than pulling it over the face or other uncontaminated areas of the body.

The skin should be flushed with cold or tepid water (NOT hot) for at least 15 minutes.

Contaminated clothing may need to be discarded as hazardous waste and any clothing that is suitable for reuse must be thoroughly washed before reuse.

2.6 **If necessary contact the Emergency Services on (9 999 or 1 999) if there is a fire or if urgent medical attention is clearly needed.** (Provide them with appropriate SDSs.)

2.7 If a volatile, flammable material is spilled, immediately warn others in the area, control any potential sources of ignition and ventilate the area to remove the vapour by opening windows, fume cupboard sashes etc. If internal doors are opened consider the direction of airflow and the potential consequences of the vapour spreading through the building.

2.8 Protect floor and/or rainwater drains or other means for environmental release. Spill socks and absorbents may be placed around drains, as needed.

3. Chemical Spill Clean-Up Procedure

Clean up the spill with reference to the instructions below and the chart above.

3.1 **Always wear personal protective equipment, appropriate to the hazards, using a minimum of safety glasses, laboratory coat and suitable gloves**.

3.2 If using absorbent powders or granules an appropriate amount should be carefully spread over the entire spill area, working from the outside and circling to the centre. Thus reducing the chance of splash or spreading of the spilled chemical.

Some absorbents neutralize acids or alkalis and may have colour change indicators to show when neutralization is complete i.e. MERCK's '*Chemizorb Range'* (from VWR-Jencons).

Other absorbents include UNI-SAFE (from Fisher Scientific) which is suitable for all chemical spills, can act as a fume/liquid barrier, has acid and alkali indicators, but does **not** neutralise.

Many other commercial absorbents are available from laboratory safety suppliers; however always check the suitability for the specific chemicals in use.

3.3 If using absorbent mats, work from the outside toward the centre carefully laying the mat onto the spill to avoid splashing or spreading the spill. Large 'mats' can be cut to size.

3.4 **Note:** Many bulk absorbents and mats/spill pillows are not suitable for hydrofluoric acid and the same maybe true for other chemicals, always consult the manufacturer's data.

MERCK's '*Chemizorb HF'* or its equivalent would be needed for hydrofluoric acid.

3.5 Several specialist mercury spill kits are available from suppliers, many use 'mercury sponges' rather than chemical combination. Broken thermometers or other mercury containing items, should be placed in a robust labelled container, and sealed, see University guidance: http://www.safety.admin.cam.ac.uk/publications/hsd037c-mercury-guidance-safe-use-and-management-contamination-university-departments

3.6 Where appropriate 'dry' powder/granular spills can be dampened prior to clearing up with a brush and scoop, using damp tissues in the final stages to remove any residue.

3.7 Where spilled substances have been absorbed, use a brush and scoop (spark-resistant if a flammable solvent is involved) to place the materials in an appropriate container. Polyethylene bags may be used for small spills, always 'double bagging' where the bag is the outer wrapper. Polythene buckets/bins with clip on lids are more appropriate for larger spills **if** chemically compatible with the spilled material.

3.8 Label the waste container or bag, identifying the material as '*spill debris'* of *'chemical name'* absorbed on 'absorbent name'. Remember the use of a non-neutralising absorbent does not alter the chemical properties of the chemical.

3.9 Complete and submit a Hazardous Chemical Waste Disposal Form and store the spill debris as appropriate until collection by the University's hazardous waste contractor.

3.10 Clean and decontaminate surfaces and equipment involved/used in the spill with an appropriate cleaning agent such as mild detergent and water.

3.11 Report all spills to your supervisor, laboratory manager or Principal Investigator.

3.12 As soon as possible replenish the supplies of absorbents etc used in the clean-up.

3.13 Review the risk assessment and revise if required, considering why the spillage occurred, how a reoccurrence could be prevented and / or mitigated i.e. by using smaller quantities / bottles, using more robust containers, by the provision of secondary containment, alternative apparatus or by revised manual handling procedures etc.

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