

POST IN LAB

What To Do When You Clean Up a Chemical Spill

- 1 **Supplies.** Laboratories must have certain supplies available before attempting to clean-up a spill. The actual materials to be used will depend upon the main hazards posed by the spilled material. A recommended list of supplies for a spill kit is presented below:

- Polypropylene pads
- Acid neutralizer

- Caustic neutralizer
- Heavy duty plastic trash bags
- Hazardous waste labels
- 5 gallon plastic container with lid
- Plastic dust pan
- Absorbent booms
- Absorbent pads
- Nitrile gloves
- Shoe covers
- pH Paper

- 2 **Don appropriate personal protection.**

Before attempting to clean-up a spill, the lab responder must put on the minimum amount of personal protective equipment:

- Splash goggles, not just safety glasses
- Lab coat with sleeves rolled down
- Nitrile or neoprene gloves - in good condition
- If the spill is on the floor, wear rubber or plastic boots (NOT leather).

- 3 **Remove ignition sources.**

- Turn off hot plates, stirring motors, flame sources.
- Shut down all equipment.
- If unable to shut off sources of ignition, notify emergency responders.
- Control the source. Carefully upright the container, place it on a polypropylene pad in a safe location, and replace the lid on the container.

- 4 **Confine or contain the spill.**

Place absorbent mixture or polypropylene pads around and on the spill. Do not use pads or booms on Hydrofluoric Acid spills.

5 Absorb Free Liquids

5.1 Acid, Caustic, or other non-Flammable Liquids

5.1.1 These are most easily absorbed with polypropylene pads. Place used polypropylene pads in a trash bag. Frequently, laboratory spills will spread into drawers and behind or under equipment. The responder must be careful to locate all such contaminated areas

5.2 Flammable Liquids

5.2.1 Flammable liquids should be absorbed with Universal Absorbent or pads or on activated carbon. Use approximately 2 pounds of activated carbon per pint (0.5 liters) of liquid. Use the dust brush to thoroughly mix the activated carbon with the liquid. Use the dust pan and brush to collect all residue. Remove large pieces of broken glass as described in step 3.3 and place all other debris in a plastic trash bag

5.2.2 Remove broken glass. Using tongs, or carefully using gloved fingers, remove all large pieces of glass and place them in the plastic container.

6 Neutralize Residues & Decontaminate the Area

6.1 Acid Spills

6.1.1 Spread acid neutralizer on all surfaces affected by the spill.

6.2 Caustic Spills

6.2.1 Spread caustic neutralizer on all surfaces affected by the spill.

6.3 Remove Neutralizer Residue

6.3.1 Scoop residue from the neutralization into waste bag.. Moisten a pad with water and carefully wipe all contaminated surfaces. Repeat this process until all traces of the neutralizer are removed. Test with pH paper until ph 6-8. If, after the clean-up is completed, the affected area is sticky, use soapy water to remove any remaining neutralizer.

6.4 Decontaminate Container

6.4.1 Use polypropylene pads, neutralizers, and soapy water, as appropriate, to remove all traces of spilled chemical from the container. Remember to clean the bottom of the container.

7 Spills that require special handling:

7.1 Acid Chlorides

7.1.1 Use Oil-Dri, Zorb-all or dry sand. Avoid water, avoid sodium bicarbonate.

7.2 Mercury

7.2.1 Small spills (broken laboratory thermometer and smaller quantities of mercury), open windows and ventilate area while cleaning.

7.2.2 Use aspirator bulb or suction device (available from Edmund Scientific).

7.2.3 Mop with mercury decontaminating powder solution (saturated solution of HgX in water).

7.2.4 Do not use vacuum cleaners.

7.2.5 For (1) spills larger than a broken laboratory thermometer, (2) any spill in an oven or heated area, and (3) spills in small unventilated rooms, call Manager, Laboratory Safety (4996) and ask for mercury-vapor monitoring instrument.

7.3 Alkali Metal (e.g., Sodium or Potassium Metals):

7.3.1 Smother with dry sand.

7.3.2 Put in hood.

7.3.3 If possible, dispose of by reaction with isopropyl alcohol.

7.4 White (Yellow) Phosphorus

7.4.1 Blanket with wet sand or wet absorbent.

8 Carefully check the entire affected area for spill residue, hidden contamination, or unsafe conditions.

9 Package and Label Residue

9.1 Place all spill residue in a plastic bag. Seal the lid on the broken glass container and place the sealed container in the bag.

9.2 Seal the bag and place a properly completed hazardous waste label on the outside of the bag. Place the bag wherever appropriate for its disposal as a hazardous waste.

10 Restock spill supplies

Comments

Questions arise as to what constitutes a large spill requiring a chemical cleanup team and what are the limitations of the spill kits commonly purchased for laboratories.

A "large" spill can be as small as a few milliliters if the material is a highly volatile and toxic compound spilled in a confined space. Many times you will have to make a professional judgment as to the severity of the spill. When in doubt you can always call Manager, Laboratory Safety at 4996.

Chemical spill cleanup kits are very handy to have in the lab and other service areas that use chemicals. The kits are useful if you and your fellow workers know how to use them properly. Chemical absorbent or neutralizing powder and pads can be used to quickly contain a spill. Use these items if your personal safety is not jeopardized. Often the best use of such a kit is to put the absorbent on the spill to contain the material, then leave the room and secure the area.

Be aware of the fact that while you may be in a well ventilated room, the Lower Explosive Limit (LEL) of a chemical may be reached at the surface of the spill and you want to avoid any sparks or sources of ignition when doing the cleanup. The protective equipment in the spill kit will not protect you from a flash fire. Many times, the best way to handle the spill of a highly volatile compound such as diethyl ether or chloroform, is to open windows and fume hoods, leave the room, close and lock the door and let the room air out. If in your professional judgment there is a strong risk of a flash fire or explosion call Manager, Laboratory Safety and 911 for fire department backup protection and evacuate the area - pull the nearest fire alarm. In most cases of a chemical bottle breaking in a laboratory, however, you will not need to call the fire department as the lab ventilation system is usually designed to handle such situations.