

Environmental Health and Safety

Chemical Spill Clean-up Procedures

Purpose

Laboratory personnel can clean up small spills if trained and equipped to do so. Small spills include chemical spills that are up to 1-liter liquids or 0.5 kilograms solids and of limited toxicity and reactivity. Small spills of metallic mercury from broken thermometers (about 1.5 grams) can be cleaned up by laboratory personnel. If respiratory protection is needed for a spill clean-up, the spill is too large to be handled by laboratory personnel – dial 911 or call EHS at (208) 885-6524 during normal business hours. Please review Table 1 for some examples of chemicals that should not be cleaned up by laboratory personnel until the situation is assessed by Environmental Health & Safety (EHS).

Table 1. Chemicals That Should Not Be Cleaned Up by Laboratory Personnel

Chemical Class	Description	Examples
Strong Acids	Any acid concentrated enough to fume, emit acid gases, or present severe health or physical hazards	Concentrated Hydrochloric Acid; Fuming Sulfuric Acid; Red Nitric Acid; Hydrofluoric Acid; Perchloric Acid
Strong Bases	Any base concentrated enough to emit vapors	Ammonium Hydroxide
Poison by Inhalation	Chemicals that readily emit vapors or gases at normal temperature and pressure that are extremely toxic by inhalation	Phosphorous Oxychloride; Titanium Tetrachloride; Chloroformates; Isocyanates
Reactive Chemicals	Chemicals that are reactive to air, water, shock, friction, and/or temperature	Dry Picric Acid; Lithium Aluminum Hydride; Sodium Borohydride; Phosphorous Metal; Organic Peroxides
Mercury	Mercury in quantities greater than small incidental amounts (e.g., more than from a broken thermometer)	Metallic Mercury; Mercury Salts; Organomercury Compounds; Aqueous Mercury Solutions
Extremely Toxic / Known Carcinogens	Chemicals are readily absorbed through the skin and highly toxic at small concentrations (e.g., LD50 < 50 mg/kg)	Benzene; bis-Chloromethyl Ether; Phenol; Sodium Cyanide

General Spill Clean-up Procedures

- Alert others in the laboratory or work area.
- If the spill presents a severe health or safety risk, activate the building fire alarm at the nearest pull station, and evacuate the building.
- Decide if you are trained, knowledgeable and equipped to handle the incident. If not, request assistance from others who are trained or call 911.



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- Never proceed to clean up a spill if you do not know the hazards associated with the chemical.
- If anyone is injured or contaminated, call 911 and begin decontamination measures or first aid, if trained and safe to do so.
- Barricade the spill area to prevent people from walking through it.
- Obtain a Chemical Spill Kit or gather the supplies you will need. See Chemical Spill Kit inventory below.
- Refer to a Safety Data Sheet (SDS) for the spilled material.
- Don the personal protective equipment from the spill kit. At a minimum, you should wear splash goggles, nitrile gloves, a lab coat and disposable booties or disposable chemical-resistant overalls with integral booties.
- If broken glass is involved, use the scoop from the spill kit and place the broken pieces in a plastic bag. Then place the bag in a strong tight container such as a 5-gallon plastic pail.
- All tools used in the clean-up need to be either disposed of or decontaminated. Remove gross contamination with a wet paper towel and collect for proper waste disposal. Wash the tools with soap and water. Dry the tools and return to the spill kit.
- Decontaminate goggles in the same manner as with tools. Dry and return to the spill kit.
- Dispose of gloves and any spill cleanup material as waste through EHS.
- Restock supplies in the Chemical Spill Kit.

Specific Procedures- Flammable Liquid Spills

- Control all sources of ignition such as flames, hot surfaces, sparking.
- Use an absorbent sock or other material to protect floor drains.
- Absorb the spill with the gray “Universal” spill pads. Paper towels, sponges, kitty litter or “Floor-Dry” may also be used. Place used absorbents in a plastic bag, preferably using tongs or other device to minimize direct contact.
- Wipe the area down with a wet paper towel. Place the paper towel in the plastic bag. Dispose gloves in the plastic bag.
- Double bag, then seal the plastic bags with tape.
- Submit a Chemical Waste Collection Request to EHS. Attach the completed chemical waste label to the bag.

Specific Procedures – Liquid Spill Other Than Flammable Liquids

- A spill of a weak or dilute inorganic acid or base can be neutralized first to a pH of 5 to 9 using a neutralizing agent such as **sodium bicarbonate, sodium bisulfate, or citric acid**. Gradually sprinkle the neutralizing agent on the spill. Check with pH paper.
- Absorb the spill with yellow “Aggressive” spill pads or other suitable absorbent.
- Use a plastic scoop from the spill kit if solids are present.
- Place used absorbents in a plastic bag, preferably using tongs or other device to minimize direct contact.



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- Wipe the area down with a wet paper towel. Dispose the towel in the plastic bag. Dispose gloves in the plastic bag.
- Double bag, then seal the plastic bags with tape.
- Submit a Chemical Waste Collection Request to EHS. Attach the completed chemical waste label to the bag.

Specific Procedures- Solid Spills

- Use a plastic scoop, scraper, or brush to collect the material. Place spilled material in a plastic bag.
- Care should be taken to avoid creating dust or causing the spilled material to become airborne.
- After the bulk of the material is cleaned up, wipe the area down with a wet paper towel. Dispose the paper towel in the plastic bag. Dispose of any contaminated PPE in the plastic bag.
- Double bag, then seal the plastic bag with tape. Submit a Chemical Waste Collection Request to EHS. Attach a completed Chemical Waste label.

Specific Procedures- Broken Thermometer Clean up

- Clean up the spill immediately after it has occurred.
- Be sure to wear shoe covers or place plastic bags over your shoes during the clean-up.
- While wearing gloves, carefully pick up the broken thermometer pieces and place in a plastic bag.
- Slowly push the mercury droplets together into a bead using an index card, small scraper, or rubber squeegee.
- Chemically inactivate the residual mercury by using a commercial inactivating powder or sponge (e.g. "Hg Absorb"). Be sure to follow its directions for use and dispose of it in a plastic bag. Typically the directions will include wetting the sponge or Hg Absorb powder and thoroughly mixing it with the mercury.
- Thoroughly wash the area with a detergent solution. Dispose sponges/paper towels in the plastic bag.
- Place the collected mercury and any contaminated PPE in the plastic bag.
- Double bag, then seal the plastic bags with tape.
- Submit a Chemical Waste Collection Request to EHS. Attach a completed Chemical Waste label.

Chemical Spill Kit

Every laboratory should have a chemical spill kit readily available and stocked with supplies that are appropriate for the types of chemicals that are used. These are commercially available from many major retailers of lab supplies, such as Grainger or Fisher. At a minimum, a spill kit should include:



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- 1 – 5-gallon plastic pail with lid, labeled “CHEMICAL SPILL KIT”
- 10 – Universal Chemical Absorbent Pads, 20"W x 15"L (Vapor Suppressive)
- 1 – pair of splash goggles
- 1 – 1-qt plastic scoop
- 1 foxtail brush
- Plastic scrapers or putty knife
- 10 - 4mm polyethylene plastic bags (for containing spill cleanup materials)
- Waste Accumulation labels (for labeling spill cleanup material to be submitted to EHS)
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Additionally, the following are optional depending on the particular hazardous chemicals located within the lab:

- 1 – 4 ft Universal Chemical Absorbent Sock, 2-3" inch diameter (recommended if a lab has a larger amount of chemicals located near a floor drain)
- 10 – “Aggressive” Chemical Absorbent pads, 15"W x 10"L for acid and caustic spills
- 2 – pair of thick Nitrile gloves (North LA115EB or equivalent)
- Acid neutralizer (if the lab has acids or acid solutions)
- Base neutralizer (if the lab has bases or base solutions)
- 2 – pair Silver Shield gloves (Note: to improve dexterity, don disposable nitrile gloves over the Silver Shield gloves)
- 1 – 1 lb box of baking soda to neutralize acid spills
- Mercury spill kit, including:
 - Hg Absorb powder
 - Hg Absorb sponges
 - Small plastic suction bottle (500 mL)
 - Flashlight
- Hydrofluoric acid spill kit (dilute solutions only)
 - 1 lb Calcium carbonate
 - 1 tube Calcium gluconate gel for skin exposure first aid
 - Two (2) pairs of Neoprene or Nitrile (22mil) gloves.
 - One (1) heavy-duty polyethylene bag to be used for items contaminated by HF.

Everyone working in the laboratory should know where the spill kit is located and how to use it properly. An ideal location for a spill kit would be near other emergency supplies located in the front of the lab, e.g. near the first aid kit, SDS binder, etc.

For any questions about assembling a hazardous material/waste spill kit or questions about spills, please contact EHS at safety@uidaho.edu or (208) 885-6524.

