TOWSON UNIVERSITY

MERCURY SPILL CLEANUP PROCEDURES

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Mercury Spill Cleanup Procedures

Read these procedures completely
before attempting to clean up mercury spills.

Mercury is found all over campus in thermometers, manometers, switches and many mechanical devices. Metallic mercury and mercury compounds are very hazardous and are regulated as hazardous wastes.

Mercury is especially difficult to handle because it is liquid at room temperature and volatile. It also presents an especially insidious situation when it breaks up into very small droplets that are difficult to see and pick up and remain in cracks and crevices and give off toxic vapors for years until the mercury evaporates.

Prevention is the best way to handle mercury spills. Avoid using mercury-containing devices. Substitute environmentally safe red liquid thermometers for mercury containing thermometers and use electronic devices to measure temperature and pressure. Contact EHS to exchange mercury-containing thermometers for environmentally safe red liquid thermometers. If you must use mercury-containing devices, use basins or other types of secondary containment devices beneath all mercury containing devices to contain any spilled mercury. Users should immediately clean up all mercury spills.

Dispose of all waste mercury and mercury contaminated cleanup materials through EHS. Wherever possible, mercury is recycled. NO mercury or mercury-contaminated materials will be disposed of via traditional domestic waste channels or via the sanitary sewer system.

Mercury Spill Cleanup Procedures

A. For Small Mercury Spills (≤5mL):

1) The user shall immediately isolate the spill area to prevent spreading the contamination. Small spills of metallic mercury can potentially involve very large areas depending on the spill surface. The smoother the surface, the greater the potential spill area. Keep uninvolved people away.

   (If the spill occurs inside of an oven or other heated device, immediately turn off the device and temporarily evacuate the area to prevent potential exposures to toxic mercury vapors.)

2) The user shall don appropriate personal protective equipment including gloves and goggles. (See the Personal Protective Equipment section below for more details.)

3) The user shall pick up broken glass and other debris from the spill area and then collect the spilled mercury.

   - To collect mercury, the user should use a small piece of cardboard/plastic (i.e., 3x5 card, etc) to centrally consolidate all visible metallic mercury. Turn off overhead lights and shine a flashlight parallel to the floor to visually identify mercury globules on horizontal surfaces.

   - Mercury can then be scooped onto another thin piece of cardboard/plastic and transferred into a sturdy waste container with a tightly fitting lid. Or it can be vacuumed up using either an Erlenmeyer flask connected to a vacuum pump or sink aspirator. NEVER use common vacuum cleaners/shop vacuums to clean up mercury spills.

4) Once all visible mercury has been collected, the user shall decontaminate the area utilizing Mercury Spill Powder (MSP), mercury absorbent paper or mercury sponges. (MSP, mercury absorbent paper and mercury sponges are commercially available. MSP may also be easily prepared by mixing 8 grams of finely powdered sodium thiosulfate with 15 grams of finely powdered EDTA.) Sprinkle the MSP over the spill area and wet it down with a water mist. Let the moistened MSP sit over night. Sweep up the MSP residue and dispose of it as a mercury containing hazardous waste.

B. For Large Mercury Spills (>5mL):

1) For larger spills (>5mL) such as barometers or manometers, the user shall immediately contain the spill as much as possible and isolate the spill area to prevent spreading the contamination. Keep uninvolved people away.

2) EHS has a commercial mercury vacuum cleaner for cleanup of spills this magnitude. Contact EHS to assist with the cleanup.

Mercury Spill Kits

There are small commercial mercury spill cleanup kits located in the Departments of Chemistry, Biological Sciences & Physics, Astronomy and Geosciences that are available for use in Smith Hall. Other campus organizations that use mercury containing thermometers or equipment shall contact EHS to obtain a mercury spill cleanup kit.

Personal Protective Equipment (PPE)

Always handle mercury with the utmost care. Gloves are a necessity. Make sure your gloves are constructed of an appropriate material—such as polyethylene or nitrile—for keeping mercury away from your skin.

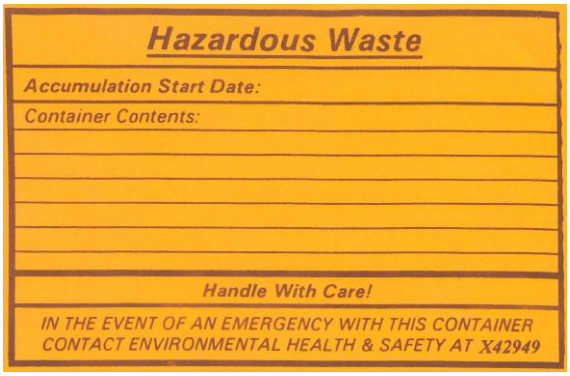
Wear appropriate eye protection, either chemical safety goggles or a full-face shield. Be sure also to wear impervious aprons or clothing to prevent skin contact and disposable shoe covers to prevent mercury contamination of footwear and spreading of mercury contamination.

For large mercury spills respiratory protection may also be required. Because mercury is odorless, an air-purifying respirator (APR) with fresh chemical cartridges approved for use with mercury should be used. Cartridges should be disposed off after each use. An APR may be worn only in circumstances where the air concentration does not exceed 0.5 mg/m^3. Mercury concentrations above this level require the use of a positive pressure supplied air respirator or a self-contained breathing apparatus (SCBA).

Mercury Waste Disposal

All waste mercury and mercury contaminated spill/cleanup materials shall be collected by the user for disposal as hazardous waste. The user shall separate liquid metallic mercury from contaminated solids and debris. All liquid metallic mercury and contaminated liquids shall be placed into a sturdy leakproof container with a tightly fitting screw cap. All contaminated dry solids shall either be placed into leakproof plastic bags or pails. Damaged thermometers shall be placed into a puncture proof container or, after carefully wrapping the sharp ends; they may also be carefully placed into a plastic bag, wide mouth jar or other puncture resistant container.

All waste containers will be labeled by the user with TU Hazardous Waste Labels listing all container contents and the date generated.



Contact EHS to request waste containers or labels. Clean glassware shall be disposed of in broken glass containers. Other clean debris may be disposed of via normal domestic waste channels.

After all wastes are properly packaged and labeled, the user must submit a completed Hazardous Waste Disposal Request to EHS for disposal of mercury contaminated spill wastes. Users are responsible for managing hazardous spill wastes in accordance with University hazardous waste management procedures until such time as waste is removed from the spill area. These procedures and the Hazardous Waste Disposal Request form are available at the following web site:

www.towson.edu/ehs/forms/index.html

Workplace Mercury Exposure Standards

Because of mercury's high toxicity, the American Conference of Governmental Industrial Hygienists (ACGIH) has set its Time Weighted Average (TWA) for mercury vapor at 0.025 milligrams per cubic meter (mg/m^3). There is no ACGIH allowable short-term exposure limit (STEL). There is a Skin Notation (a warning to the effect that a given substance is easily absorbed through the skin). The US Department of Transportation has classified mercury as a corrosive material.

OSHA's Ceiling Concentration (the concentration that shall not be exceeded at any time) is 0.10 mg/m^3 and is strongly enforced.

EHS has passive mercury vapor monitoring devices that can be used to monitor long term mercury spill vapor concentrations if necessary. These devices are sent off-campus for analysis and analysis typically takes 5-10 business days.

Medical Effects of Mercury

Mercury commonly enters the body through inhalation, skin absorption, or consumption. Inhalation is the primary route of exposure. Symptoms of mercury poisoning can include coughing, chest pain, painful breathing, bronchopneumonia, tremors, insomnia, irritability, headache, fatigue, gastrointestinal distress, and liver and kidney damage.

Chronic exposure to low levels over time may cause mental and motor disorders resulting from damage to the central nervous system. Acute exposure to high levels of mercury vapor often leads to severe respiratory damage. Mercury can be absorbed through the skin; physical contact causes burns to skin and eyes. In such cases, the burning sensation is delayed several hours and gives no warning to exposure.

If overexposed to mercury vapor, move to fresh air immediately. Should mercury contact your skin, remove your clothing immediately and wash the area with mild soap and large amounts of water for 15 minutes. In case of eye contact, flush your eyes with water for a full 15 minutes. Seek medical attention immediately.

If you feel that you have been exposed to dangerous concentrations of mercury, contact your personal physician immediately.

Additional Information:

http://www.epa.gov/mercury/index.html

http://www.osha.gov/SLTC/healthguidelines/mercuryvapor/index.html

http://www.atsdr.cdc.gov/toxprofiles/phs46.html

http://www.mde.state.md.us/Programs/LandPrograms/Hazardous_Waste/mercury/index.asp

Questions:

If there are any questions, feel free to contact EHS at (410) 704-2949 or via email at safety@towson.edu.