



Cleaning up mercury spills in your school

Pollution Prevention/Sustainability fact sheet #4.03, October 2005

What is mercury?

Mercury is an element that exists in a variety of forms: as a pure liquid that can vaporize, and as organic and inorganic compounds. Liquid mercury, also known as "quicksilver" due to its liquid metallic appearance, has unique physical and chemical properties, and has been widely used in industry, homes and schools.

Where is mercury found in schools?

Chemistry and biology labs: Because mercury conducts electricity, expands uniformly with temperature, and easily forms alloys with other metals, it is found in a variety of laboratory equipment (*e.g.*, thermometers, barometers, psychrometers). It is used (as is the case with mercuric compounds) in a variety of experiments also.

School nurse's station: Mercury in fever thermometers and blood pressure cuffs may be found in the school nurse's station.

Throughout the school: Mercury-containing thermostats and switches may be found in rooms throughout a school. New and used fluorescent lamps, which contain mercury, may be stored in custodial areas.

What to do when mercury is spilled

The Minnesota Pollution Control Agency (MPCA) recommends having a professional emergency response

contractor clean up mercury spills. If the spill is minor, school staff trained in hazardous materials spill cleanups may take on cleanup responsibilities.

Spill Response Action Steps:

1. Evacuate the spill area. Leave all shoes, clothing and other articles that were splashed with mercury at the spill area.
2. Wash skin exposed to mercury with soap and water.
3. Immediately open the room's outside windows and exterior doors to provide ventilation.
4. Seal off the room from the rest of the building by closing all interior doors and windows. Close all cold-air returns so that mercury vapor is not carried throughout the school.
5. Lower the temperature of the room by turning off the heat to that room. The ventilation and cooling systems to the spill area should be turned off. If possible, all air ducts to the room should be sealed temporarily.
6. Turn off fans unless they vent to the outdoors. Use portable fans to blow mercury-contaminated air outdoors.
7. If someone has inhaled mercury vapor or ingested mercury, call a poison control center at **(800) 222-1222**.
8. Call the Minnesota Duty Officer at **(651) 649-5451** or **(800) 422-0798** and report the mercury spill, no matter how small it is.



9. Hire a professional emergency response contractor or make sure that a trained staff person takes responsibility for cleaning up the mercury spill.
10. After cleanup is completed, temporarily (for a few days) elevate the room temperature to 80 to 90° F. Continue to ventilate the spill area for at least two days before reoccupying it. Direct all ventilation outside if possible.
11. Monitor the spill area to ensure that mercury vapor levels meet Minnesota Department of Health criteria.
12. Properly recycle all mercury waste or dispose of it as hazardous waste. Contact your county solid or hazardous waste office for recycling or disposal information.

Why is spilled mercury a concern?

Mercury is a toxin that can affect the nervous system of humans. It can also damage the liver and kidneys. Even small amounts of spilled mercury are a health hazard, because mercury volatilizes at room temperature and students and staff may be exposed to toxic levels through inhalation. Unlike inhalation, ingestion of liquid mercury is not typically a concern because this type of mercury does not easily pass from the gastrointestinal system into blood. In addition, people usually can avoid swallowing mercury that has been spilled.

Most symptoms of mercury exposure are subtle. Symptoms may include pink skin, skin rashes or lesions, muscle tremors, personality and behavioral changes, memory loss and damage to the kidneys and central nervous system.

Spilled mercury is also a concern because it contributes to mercury pollution of the atmosphere. Mercury in rain contaminates lakes, causing significant fish contamination. Even a small amount of mercury is a concern — the atmosphere brings about one gram of mercury each year (an amount equal to the mercury contained in one fever thermometer) to a 20-acre Minnesota lake.

Inhalation exposure criteria

When assessing sites for mercury contamination, the MPCA uses the Minnesota Department of Health (MDH) criteria for acute and chronic mercury exposure. *Acute toxicity* generally means that a short exposure period results in an adverse health effect. *Chronic toxicity* means that symptoms occur following lengthy exposure or a series of shorter exposures.

Short- and long-term exposure risks

MDH acute health-based criteria are used when the exposure is for an hour or less. MDH chronic health-based criteria are used for extended periods or for averaging exposures over a year. When exposures are at or below these criteria, the general public or even vulnerable people (such as children or women of child-bearing age) should not have adverse health effects. However, as mercury concentrations or length of exposure increase to exceed these criteria, the risk of experiencing adverse health effects increases, and any related health effects may become more severe.

Exposure to mercury vapor

The MDH acute exposure criterion for mercury vapor is 1,800 nanograms per cubic meter (ng/m^3). This mercury vapor concentration should not be exceeded in students' or teachers' breathing space (this does not necessarily include areas inside or under cabinets). The chronic exposure criterion for mercury vapor is 300 ng/m^3 .

Students and teachers may also be exposed to mercury in places other than school, such as mercury vapor at home or to methylmercury through the eating of fish. Because of these other exposure pathways and because children are more sensitive to mercury toxicity than adults, the MDH recommends that mercury vapor exposure of children (and women of child-bearing age) in particular be minimized.

Cleanup standards

The MPCA and the MDH recommend that the mercury vapor concentration in schools not exceed the chronic level for mercury exposure. If chronic mercury



exposures occur in your school, the MPCA and MDH recommend clean-up action until mercury vapor levels meet the MDH chronic exposure criteria (300 ng/m³).

A few mercury “nevers”

- **Never heat liquid mercury.** When heated, mercury evaporates rapidly, causing it to go into the air as mercury vapor that can be inhaled.
- **Never use a vacuum cleaner or a broom to clean up a mercury spill.** A vacuum heats mercury and disperses it to the air, creating a larger hazard. Brooms break mercury into smaller drops and cause further dispersion. The MPCA recommends that so-called “mercury vacuums” be used only when the exhaust is monitored with a mercury vapor analyzer. Improper use of these mercury vacuums releases mercury vapor to the atmosphere. The result is the contamination of an even larger area.
- **Never pour mercury down a drain.** Mercury becomes lodged in pipes, pollutes wastewater-treatment plants and makes its way to our lakes and streams. There it can contaminate fish and the animals and people who eat them.
- **Never throw fluorescent or high-intensity discharge lamps in the garbage or trash.** These bulbs contain mercury. It is illegal to throw mercury waste in with the regular garbage or trash because of the potential to harm health and pollute the environment. Lamps must be either properly recycled or managed as hazardous waste.

The best advice: Keep mercury out of your school.

Avoid buying products and devices that contain mercury. Mercury-free substitutes exist for just about everything:

- alcohol (red or blue bulb) and digital thermometers,
- electronic thermostats and switches,
- aneroid blood-pressure units, and
- digital barometers and other gauges.

Even though fluorescent lamps contain mercury, the MPCA still recommends their use due to the energy

savings. Handle and store new and used lamps very carefully to avoid breaking them and releasing mercury. When more than one or two fluorescent lamps are broken simultaneously indoors, a potential mercury inhalation hazard exists. Broken fluorescent bulbs need to be cleaned up like a mercury spill.

Need more help?

Reporting a spill: You must call the Minnesota Duty Officer at (651) 649-5451 or (800) 422-0798 (24 hours a day).

For more hazardous waste information, go to the MPCA’s Web site at www.pca.state.mn.us/waste/pubs/business.html or call the MPCA at (651) 297-2274 or (800) 657-3864.

To learn how your school can become mercury free, visit the MPCA’s Web site at www.pca.state.mn.us/programs/mercury-free/index.html. Schools participating in the Mercury-Free Zone Program sign a pledge agreeing to become mercury free. Participating schools receive some free replacement equipment, free disposal of mercury-bearing equipment, a curriculum about mercury and other persistent biological toxins, and a visit by Clancy, the MPCA’s mercury-detecting dog.

If you have mercury and health-related questions: Call the Minnesota Department of Health at (651) 215-0916 or (800) 657-3908, press “4.” The MDH can provide health education materials and consultation to your school and community.