

## What to Do if a Compact Fluorescent Light (CFL) Bulb or Fluorescent Tube Light Bulb Breaks in Your Home<sup>1</sup>

Fluorescent light bulbs contain a small amount of mercury sealed within the glass tubing. When a fluorescent bulb breaks in your home, some of this mercury is released as mercury vapor. The broken bulb can continue to release mercury vapor until it is cleaned up and removed from the residence.

To minimize exposure to mercury vapor, EPA recommends that residents follow the cleanup and disposal steps described below. This cleanup guidance represents the minimum actions recommended to clean up a broken CFL, and will be updated as EPA identifies more effective cleanup practices.

### CLEANUP AND DISPOSAL OVERVIEW

The most important steps to reduce exposure to mercury vapor from a broken bulb are:

#### 1. Before cleanup

- a. Have people and pets leave the room.
- b. Air out the room for 5-10 minutes by opening a window or door to the outdoor environment.
- c. Shut off the central forced air heating/air-conditioning system, if you have one.
- d. Collect materials needed to clean up broken bulb:
  - stiff paper or cardboard;
  - sticky tape;
  - damp paper towels or disposable wet wipes (for hard surfaces); and
  - a glass jar with a metal lid or a sealable plastic bag.

#### 2. During cleanup

- a. **DO NOT VACUUM.** Vacuuming is not recommended unless broken glass remains after all other cleanup steps have been taken. Vacuuming could spread mercury-containing powder or mercury vapor.
- b. Be thorough in collecting broken glass and visible powder.
- c. Place cleanup materials in a sealable container.

#### 3. After cleanup

- a. Promptly place all bulb debris and cleanup materials outdoors in a trash container or protected area until materials can be disposed of. Avoid leaving any bulb fragments or cleanup materials indoors.
- b. Next, check with your local government about disposal requirements in your area, because some localities require fluorescent bulbs (broken or unbroken) be taken to a local recycling center. If there is no such requirement in your area, you can dispose of the materials with your household trash.
- c. If practical, continue to air out the room where the bulb was broken and leave the heating/air conditioning system shut off for several hours.

## Before Cleanup

- Have people and pets leave the room, and avoid the breakage area on the way out.
- Open a window or door to the outdoors and leave the room for 5-10 minutes.
- Shut off the central forced-air heating/air conditioning (H&AC) system, if you have one.
- Collect materials you will need to clean up the broken bulb:
  - Stiff paper or cardboard
  - Sticky tape (e.g., duct tape)
  - Damp paper towels or disposable wet wipes (for hard surfaces)
  - Glass jar with a metal lid (such as a canning jar) or a sealable plastic bag(s)

## Cleanup Steps for Hard Surfaces

- Carefully scoop up glass fragments and powder using stiff paper or cardboard and place debris and paper/cardboard in a glass jar with a metal lid. If a glass jar is not available, use a sealable plastic bag. (NOTE: Since a plastic bag will not prevent the mercury vapor from escaping, remove the plastic bag(s) from the home after cleanup.)
- Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder. Place the used tape in the glass jar or plastic bag.
- Wipe the area clean with damp paper towels or disposable wet wipes. Place the towels in the glass jar or plastic bag.
- Vacuuming of hard surfaces during cleanup is not recommended unless broken glass remains after all other cleanup steps have been taken. [NOTE: It is possible that vacuuming could spread mercury-containing powder or mercury vapor, although available information on this problem is limited.] If vacuuming is needed to ensure removal of all broken glass, keep the following tips in mind:
  - Keep a window or door to the outdoors open;
  - Vacuum the area where the bulb was broken using the vacuum hose, if available; and
  - Remove the vacuum bag (or empty and wipe the canister) and seal the bag/vacuum debris, and any materials used to clean the vacuum, in a plastic bag.
- Promptly place all bulb debris and cleanup materials, including vacuum cleaner bags, outdoors in a trash container or protected area until materials can be disposed of. Avoid leaving any bulb fragments or cleanup materials indoors.
- Next, check with your local government about disposal requirements in your area, because some localities require fluorescent bulbs (broken or unbroken) be taken to a local recycling center. If there is no such requirement in your area, you can dispose of the materials with your household trash.
- Wash your hands with soap and water after disposing of the jars or plastic bags containing bulb debris and cleanup materials.
- Continue to air out the room where the bulb was broken and leave the H&AC system shut off, as practical, for several hours.

## Cleanup Steps for Carpeting or Rugs

- Carefully scoop up glass fragments and powder using stiff paper or cardboard and place debris and paper/cardboard in a glass jar with a metal lid. If a glass jar is not available, use a sealable plastic bag. (NOTE: Since a plastic bag will not prevent the mercury vapor from escaping, remove the plastic bag(s) from the home after cleanup.)

- Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder. Place the used tape in the glass jar or plastic bag.
- Vacuuming of carpeting or rugs during cleanup is not recommended unless broken glass remains after all other cleanup steps have been taken. [NOTE: It is possible that vacuuming could spread mercury-containing powder or mercury vapor, although available information on this problem is limited.] If vacuuming is needed to ensure removal of all broken glass, keep the following tips in mind:
  - Keep a window or door to the outdoors open;
  - Vacuum the area where the bulb was broken using the vacuum hose, if available, and
  - Remove the vacuum bag (or empty and wipe the canister) and seal the bag/vacuum debris, and any materials used to clean the vacuum, in a plastic bag.
- Promptly place all bulb debris and cleanup materials, including vacuum cleaner bags, outdoors in a trash container or protected area until materials can be disposed of. Avoid leaving any bulb fragments or cleanup materials indoors.
- Next, check with your local government about disposal requirements in your area, because some localities require fluorescent bulbs (broken or unbroken) be taken to a local recycling center. If there is no such requirement in your area, you can dispose of the materials with your household trash.
- Wash your hands with soap and water after disposing of the jars or plastic bags containing bulb debris and cleanup materials.
- Continue to air out the room where the bulb was broken and leave the H&AC system shut off, as practical, for several hours.

#### **Future Cleaning of Carpeting or Rugs: Air Out the Room During and After Vacuuming**

- The next several times you vacuum the rug or carpet, shut off the H&AC system if you have one, close the doors to other rooms, and open a window or door to the outside before vacuuming. Change the vacuum bag after each use in this area.
- After vacuuming is completed, keep the H&AC system shut off and the window or door to the outside open, as practical, for several hours.

#### **Actions You Can Take to Prevent Broken Compact Fluorescent Light Bulbs**

Fluorescent bulbs are made of glass and can break if dropped or roughly handled. To avoid breaking a bulb, follow these general practices:

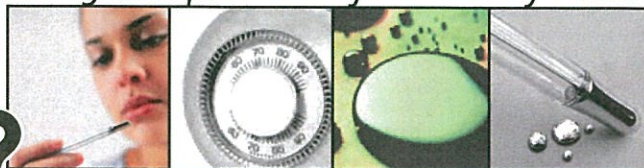
- You can switch off and allow a working CFL bulb to cool before handling.
- You can handle CFL bulbs carefully to avoid breakage.
  - If possible, screw/unscrew the CFL by holding the plastic or ceramic base, not the glass tubing.
  - Gently screw in the CFL until snug. Do not over-tighten.
  - Never forcefully twist the glass tubing.
- You can choose not to install CFLs in table lamps and floor lamps that can be easily knocked over, in unprotected light fixtures, or in locations where they can easily be broken, such as play spaces.
  - Other available options for these areas: LEDs (super-efficient, with very low energy costs; pricey, although prices are dropping rapidly), and halogens (inexpensive, more efficient than incandescents, but not as efficient as CFLs or LEDs).
- You can purchase CFL bulbs that have a glass or plastic cover over the spiral or folded glass tube, if available. These types of bulbs look more like incandescent bulbs and may be more durable if dropped.

- You can consider using a drop cloth (e.g., plastic sheet or beach towel) when changing a fluorescent light bulb in case a breakage should occur. The drop cloth will help prevent mercury contamination of nearby surfaces and can be bundled with the bulb debris for disposal.

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<sup>1</sup> This document contains information designed to be useful to the general public. This document does not impose legally binding requirements, nor does it confer legal rights, impose legal obligations, or implement any statutory or regulatory provisions. This document does not change or substitute for any statutory or regulatory provisions. This document presents technical information based on EPA's current understanding of the potential hazards posed by breakage of mercury-containing fluorescent lamps (light bulbs) in a typical household setting. Finally, this is a living document and may be revised periodically without public notice. EPA welcomes comments on this document at any time and will consider those comments in any future revisions of this document.

# Is Your Home Mercury Free?



## What is mercury?

Mercury is a silver liquid. It is naturally occurring. Just because it's natural doesn't mean it's safe.

Mercury was once used in a variety of household items. We now know that mercury is harmful to your health and the health of your family.



## How can you and your family come into contact with mercury?

Mercury comes in many forms. You can see some forms of mercury, like the silver liquid that may be found in some thermometers and other items around your home. This type of mercury is known as *metallic mercury*.

Some forms of mercury you can't see, like the kind in certain types of fish that you eat. This type of mercury is called *methylmercury*. To learn more about mercury in fish, visit [www.michigan.gov/eatsafefish](http://www.michigan.gov/eatsafefish).



## Why is it important to make my home mercury free?

Mercury is harmful to your health and your family's health. Household items that may contain mercury can break. It is best to get rid of these items before they break. Read the Michigan Department of Community Health (MDCH) fact sheet "Get Rid of Mercury Safely" to learn how to pack your household mercury items for transporting them to a Clean Sweep site or community hazardous waste collection center.

If a mercury-containing item breaks, mercury vapors get into the air. These vapors can remain in the air for a long time if not cleaned up properly. Breathing in mercury vapors can cause health problems. To learn more about mercury and your health, see the MDCH fact sheet "Mercury and Your Family's Health".



Cleaning up spilled mercury should be done right. Large spills can be complicated and likely require a professional to assist in the cleanup, which can be expensive. Cleanup for mercury spills may not be covered by your insurance policy. Small spills can still be complicated and disruptive to you and your family. See the MDCH fact sheet "Mercury Spill Quick Guide" and "How to Clean Up Spilled Mercury," for more information about cleaning up spills.



**Note:** Household items that contain mercury should never be thrown away. Many Clean Sweep sites and community household hazardous waste collection centers accept mercury-containing items free of charge. Remember to transport your mercury-containing items safely.

## What are some household items that contain mercury?

The following are some household items that may contain mercury. For more examples, visit the United States Environmental Protection Agency (EPA) website at: [www.epa.gov/mercury](http://www.epa.gov/mercury).

### Free-flowing mercury

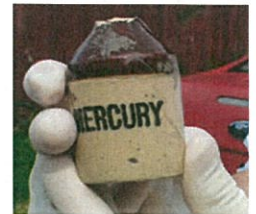
Free-flowing mercury is usually stored in containers like old baby food jars.



These containers can be found in garages, basements, crawl spaces, pole barns and even backyards of homes.

If you find a container like the ones pictured, it is best not to open it, throw it away or dump it out. Carefully wrap the container and take it to a Clean Sweep site or your local community hazardous waste collection center. To find a Clean Sweep site in your area,

visit [www.michigan.gov/mercuryp2](http://www.michigan.gov/mercuryp2), [www.michigan.gov/cleansweep](http://www.michigan.gov/cleansweep), [www.Earth911.org](http://www.Earth911.org), or [www.michiganenergyoptions.org](http://www.michiganenergyoptions.org).



The amount of free-flowing mercury can vary. More than likely, if a container of free-flowing mercury spilled, it would be a large spill.

### Clocks

Antique grandfather clocks, or long case clocks, are examples of the types of clocks that may contain mercury in the pendulums. The weighted pendulums in these clocks swing back and forth, with each swing counting one second.

Newer grandfather clocks and digital clocks use non-mercury alternatives and are just as accurate.



If you have a clock with mercury in the pendulums, talk with a clock shop to see if they are able to replace them with non-mercury alternatives. Remember to have the mercury weights disposed of safely at a Clean Sweep site or a community hazardous waste collection center.

The mercury in the pendulums could have several pounds (greater than two tablespoons) of mercury in them. If the mercury were to spill out, this would be a large spill.

### Barometers

Barometers are devices that measure air pressure. Mercury in the barometer rises or falls with changes in air pressure.

Antique barometers can contain mercury. There are non-mercury barometers that are digital or have non-mercury liquid and are just as accurate.

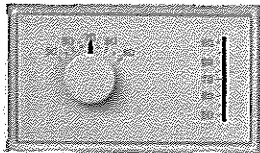
If a mercury-containing barometer were to break, it could have more than quarter of a pound, or half a tablespoon, of mercury in it. This would be a large spill.



**Note:** Household items that contain mercury should never be thrown away. Many Clean Sweep sites and community household hazardous waste collection centers accept mercury-containing items free of charge. Remember to transport your mercury-containing items safely.

## Thermostats

Older thermostats use mercury tilt switches to control room temperature. The tilt switch is a glass bulb with mercury in it. Digital thermostats are mercury-free.



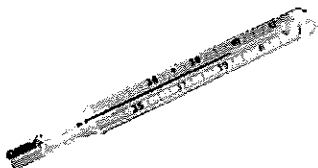
Mercury-containing thermostats have 3 grams, or about an 1/8 of a teaspoon, of mercury in them. If mercury is tracked around, the small amount of mercury spilled can turn into a large cleanup.

Michigan law, Public Act 492 of 2006, bans the sale of thermostats that contain mercury or a mercury compound. Visit

[www.michigan.gov/mercuryp2](http://www.michigan.gov/mercuryp2) for more information about mercury legislation in Michigan.

## Thermometers

Common household mercury thermometers include fever thermometers and oven, candy and meat thermometers.



Mercury thermometers are made of glass with the mercury inside.

Newer thermometers don't have mercury in them. Some newer thermometers are digital, while others are glass with an alcohol-based red or blue liquid inside. They are just as accurate.

A mercury thermometer has about 0.5 grams, or much less than an 1/8 of a teaspoon, of mercury. This amount would be considered a small spill, unless mercury is tracked around.

Under Michigan law, Public Act 578 of 2002, a person shall not sell, offer for sale or offer for promotional purposes a mercury thermometer in the state of Michigan. Visit [www.michigan.gov/mercuryp2](http://www.michigan.gov/mercuryp2) for more information about mercury legislation in Michigan.

## Compact Fluorescent Light (CFLs)

CFL bulbs are energy-efficient light bulbs. They contain a very small amount of mercury. Mercury is not released when the bulb is intact or in use.

The amount of mercury vapor released from one broken CFL bulb is not enough to make anyone sick. A fever thermometer has about 100 times more mercury than a CFL bulb.

Remember when your CFL bulb burns out to recycle it at a Clean Sweep site or a household hazardous waste collection center. Some local home improvement stores also recycle CFL bulbs.

For more information on CFLs, check out the MDCH fact sheet "CFLs and Mercury".



**Note:** Household items that contain mercury should never be thrown away. Many Clean Sweep sites and community household hazardous waste collection centers accept mercury-containing items free of charge. Remember to transport your mercury-containing items safely.

## Summary

Below is a summary of some of household items that may contain mercury.

Common Item	Source of Mercury	Amount (Weight) of Mercury	Spill Risk (No spill risk if intact.)
CFL bulbs	Sealed in the bulb	Cannot be seen (about 4 milligrams); 100 times less than a thermometer	<b>Very small</b> - if bulb is broken.
Thermometers	Sealed in the bulb of glass thermometers	Much less than 1/8 teaspoon (about 500 milligrams)	<b>Small</b> - if mercury is not tracked around.
Thermostats	Sealed in the glass tilt switch	Less than 1/8 teaspoon (about 3,000 milligrams)	<b>Varies</b> - if tilt switch is damaged or broken and is tracked around the home, a large spill.
Barometers*	In the dial or glass tube	At least 1/2 tablespoon (more than 1/4 pound)	<b>Large</b> - if dial, wheel, or glass tube is damaged.
Clocks*	As weights in the pendulum	More than 2 tablespoons (several pounds)	<b>Large</b> - if pendulum is damaged.
Free-flowing Mercury*	A container or jar	Varies	<b>Large</b> - if container is broken or open.

\*The release of a large quantity of mercury, such as a barometer or clock, or an unknown quantity, should be reported to the National Response Center ([www.nrc.uscg.mil/nrchp/html](http://www.nrc.uscg.mil/nrchp/html))

## Find a Recycling Site Near You

Many Clean Sweep sites and community household hazardous waste collection centers accept mercury-containing items from the public at no charge.



To find a collection site near you, visit [www.michigan.gov/mercuryp2](http://www.michigan.gov/mercuryp2), [www.michigan.gov/cleansweep](http://www.michigan.gov/cleansweep), [www.Earth911.org](http://www.Earth911.org), or [www.michiganenergyoptions.org](http://www.michiganenergyoptions.org).

Recycling sites are not able to take cleanup debris. To find out how to dispose of cleanup debris, call the Environmental Assistance hotline at 1-800-662-9278.

## Want to learn more?

### For Public Health Questions

Contact the Michigan Department of Community Health (MDCH) at 1-800-648-6942 or visit [www.michigan.gov/mercury](http://www.michigan.gov/mercury) for these other fact sheets:

Michigan Department  
of Community Health



- Mercury Spill Quick Guide
- How to Clean Up Spilled Mercury
- Mercury & Your Family's Health
- Mercury Spills & Your Pet
- Mercury Spills - Hiring a Cleanup Contractor
- Get Rid of Mercury Safely
- Mercury and Electrical Work
- Mercury and HVAC Systems
- Mercury and Plumbing
- Mercury and Renovation/Energy Upgrade

### For Mercury Pollution Prevention and Recycling Questions

Contact the Michigan Department of Environmental Quality (MDEQ) at 1-800-662-9278 or visit [www.michigan.gov/mercuryp2](http://www.michigan.gov/mercuryp2) for more information on mercury pollution prevention.

