

## Straight, U-tube and Circular



Most straight, circular and U-tubes contain less than 10 mg mercury per bulb.



## Compact Fluorescent Lamps (CFL)



Compact spirals contain up to 5 mg mercury per bulb; other compacts contain up to 10 mg mercury per bulb.



## High Intensity Discharge (HID) Lamps



HID is the term used for several types of lamps including metal halide, mercury vapor and high pressure sodium. Most lamps contain 10 mg to 1,000 mg mercury.

## Mercury Vapor Lamps



Most mercury vapor lamps contain between 10 and 100 mg of mercury.

### Mercury Lamp Disposal

Recycle fluorescent lamps and mercury devices at your town's recycling center year-round.

## A History of Mercury

Mercury occurs naturally in the environment. It was regularly mined after the discovery of its presence in cinnabar ore. Called "quicksilver," mercury was used to increase the efficiency of gold mining by attaching to the gold dust being flushed out of mines. This gold-mercury mixture separated the elements from gravel and sediments. Due to their constant exposure to the toxin, the miners' life expectancy was three years.

Mercury was used in another form—mercurous nitrate—in hatmaking. In order to create felt used for hats, the chemical was brushed onto rabbit fur to make it more easily mat. The felt was later dipped in an acid solution to harden it, and chemical reactions in the process turned the mercurous nitrate into elemental mercury. In 1941, the U.S. Public Health Service banned the use of mercury in hatmaking because the "Mad Hatters" suffered tremors, memory loss and personality changes as well as other symptoms due to their long-term exposure.



Mercury is used in devices today because of its excellent conductivity and high surface tension which allows it to roll freely. In a switch, for example, it makes or breaks electrical circuits signaling the furnace to heat or cool the air. Most people are not exposed to mercury because it is contained in a protective bulb. The harm is done when it breaks—often due to accidents when handling or after disposal.

## Mercury Disposal

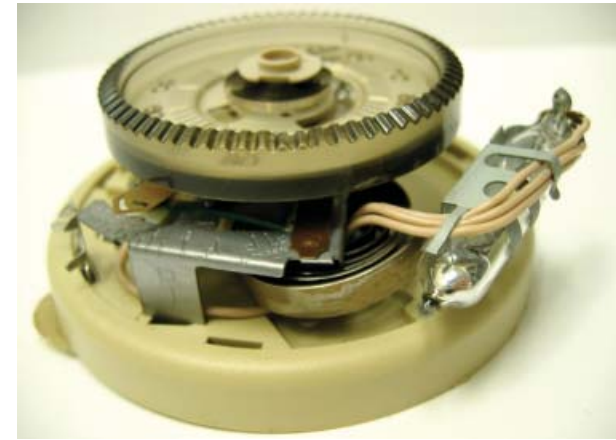
The Barnstable County Hazardous Materials Program has coordinated mercury collection programs on Cape Cod since 2001.

Every town on Cape Cod participates in this program by recycling mercury-containing devices at transfer stations and recycling centers. Residents and businesses may also bring mercury devices (except for bulbs) to Household Hazardous Products Collections held in Cape Cod towns. Participating businesses store mercury-containing items which are then collected by county staff and AmeriCorps Cape Cod members. Marinas, marine repair shops, electric and plumbing suppliers, heating and air-conditioning contractors, among others, participate.

Disposal of collected materials is paid for through a Materials Separation Plan mandated by the state. It is funded by Maximum Achievable Control Technology (MACT) fees of fifteen dollars paid by towns for each ton of trash brought to SEMASS. Fifty cents per ton is used to fund the mercury reduction program. The mercury is reclaimed by businesses that purify the mercury and sell it to commercial and manufacturing businesses where mercury continues to serve a purpose.



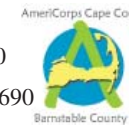
# The Dangers of MERCURY in Your World.



- More than forty-five states have fish consumption advisories due to high levels of mercury contamination.
- The sale of mercury thermometers is banned in Boston and other cities across the U.S.
- Mercury is an element that cannot be broken down. Once inside the human body it accumulates.



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Barnstable County  
**HAZARDOUS MATERIALS PROGRAM**  
Collaborating with the University of Massachusetts Extension  
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## Why is Mercury a Problem?

Mercury is a silver metal that is liquid at room temperature and is toxic to the human nervous system. If touched, inhaled or swallowed it affects human speech, motor skills and rational thought. It can cause damage to the central nervous system, cardiovascular collapse, kidney failure and birth defects such as mental retardation.



## From Pollution to Health Hazard

One way in which mercury is released into the environment is through use in household devices that are eventually broken, incinerated or disposed of in landfills. The other is through the burning of coal, oil and natural gas in factories and power plants. The mercury becomes a gas, rises into the atmosphere and attaches to water molecules, falling into our soil and water when it rains or snows.

In the water bacteria breaks it into methyl-mercury—a more toxic form—and it is absorbed by plankton. When fish eat the plankton, the toxin bioaccumulates in their tissue.

“Bioaccumulation” is the buildup of a substance in the tissues of a living organism. When a human or animal eats the fish, the toxin passes to their tissue where it continues to accumulate.

## Is There Mercury in Your Home?

### Thermostats

A good alternative to a mercury thermostat is a digital programmable version.



### Thermometers

If there is a silver substance inside your thermometer, it's mercury. Red, blue or other colored liquids are alcohol-based. Trade in your mercury thermometer for a digital thermometer.



### Light Bulbs

Consider switching to compact fluorescent lamps (CFLs). They contain mercury as do circular and tube fluorescent lamps, but they last longer and consume 3-4 times less energy.



### Switches

Float switches, electrical switches, tilt switches and other appliance switches contain mercury. Replace broken ones with switches that don't contain mercury.



### Batteries

Hearing aid, camera and watch batteries, and alkalines made before 1996 contain mercury.



## How Much Mercury?

Barometers	500g
Thermostats	4.5g
Small Switches	4g
Large Switches	up to 40g
CFLs	4 to 10mg
HID Lamps	up to 1000mg
Fluorescent Lamps (per linear foot)	3.3mg
Fever Thermometers	1g
Button Cell Batteries	9mg
Blood Pressure Monitors	110g

### Mercury can also be found in:

- old toys
- electric organs
- pesticides
- skin creams
- anti-lock brake systems
- automotive security systems
- flame sensors in appliances
- laptop computer covers
- some household cleaners

## Why is There Mercury in Lighting?

A fluorescent lamp is an electrical discharge lamp that operates at a very low gas pressure. It produces light when electric current passes between two electrodes (also called cathodes) in a tube filled with low-pressure mercury vapor and inert gases such as argon and krypton. The electric current excites the mercury vapor in the tube, generating radiant energy, primarily in the ultraviolet (UV) range. The energy causes a phosphor coating on the inside of the tube to fluoresce, converting the UV light into visible light. Mercury is present in the lamp in both the phosphor powder and in the vapor.

Fluorescent lamps require a ballast, which is a device used to provide, and control, the voltage in the lamp, as well as stabilize the current in the circuit.

Fluorescent and other mercury-added lamps are more efficient than incandescent light bulbs of an equivalent brightness because more of the energy input is converted to usable light and less is converted to heat. They also have a longer lamp life. While the lamps are being used, the mercury within them poses no health risk.

When lamps are broken, burned in waste-to-energy plants or buried in landfills, the mercury is released. Since the mercury is a necessary ingredient in these lamps, the lamps should be used, and recycled or managed as hazardous waste when they are no longer used.

### Typical types of fluorescent lamps:

straight	bug zapper
U-tubes	black light
circular	high output
tanning	germicidal