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A joint program of the

MINNESOTA POLLUTION CONTROL AGENCY
1-800-657-3864 TDD: 612-282-5332

MICHIGAN DEPARTMENT OF
ENVIRONMENTAL QUALITY
1-800-662-9278

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
1-608-266-2111

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the waste connection
MERCURY
IN THE ENVIRONMENT



DO YOU WORK WITH ANY OF THESE ITEMS THAT MAY CONTAIN MERCURY?

- FLUORESCENT LAMPS
- MERCURY SWITCHES
- MERCURY VAPOR LAMPS
- THERMOSTAT PROBES
- METAL HALIDE LAMPS
- RELAYS
- HIGH PRESSURE SODIUM LAMPS
- THERMOMETERS
- NEON LAMPS
- THERMOSTATS
- DENTAL AMALGAM
- MANOMETERS
- GAUGES
- LABORATORY SOLUTIONS



If you do, be careful to keep them out of the trash or drain when they reach the end of their useful lives. When products containing mercury are placed in the trash, the mercury doesn't disappear. It finds its way into the environment from waste incinerators, landfills, or wastewater treatment facilities.

Mercury is a nerve toxin that may impair the way we see, hear, walk and talk. Atmospheric mercury mixes with rain and snow and falls into lakes and waterways. When mercury is deposited in lakes or waterways, bacteria convert it to methyl mercury. Methyl mercury

contaminates the food chain and builds up in the tissue of fish and of wildlife and humans who eat the fish. Because of high mercury concentrations in the fish, Great Lakes states issue advisories each year cautioning people to limit how much fish they eat.

About two-thirds of the mercury in the atmosphere comes from human-made sources like coal-burning power plants and incinerators. The remaining mercury comes from natural sources, such as volcanoes and forest fires.



About a gram of mercury enters a 20-acre lake each year. A gram of mercury is only a small drop. A teaspoonful of mercury weighs about 70 grams. By comparison, a thermostat contains about 3 grams of mercury. A mercury switch contains about 3.5 grams of mercury. One hundred fluorescent lamps contain about 4 grams of mercury.

Even these small amounts of mercury in lake water can contaminate the fish, making them unfit to eat on a regular basis. For example, an adult walleye can have a mercury concentration 150,000 times as high as the water surrounding it. This situation results in fish consumption advisories.

Minimizing mercury releases from all sources is important. If we want to continue eating the fish we catch and seeing the fish-eating wildlife (e.g., loons, eagles, osprey), we need to protect our environment from releases of mercury. It takes all of us to manage mercury wastes properly and to keep mercury out of the environment. Local, state, and national governments are working in partnership with businesses to develop collection systems for these wastes.

Contact your county or state environmental office or solid waste office for ways to participate in these programs. Select the information that pertains to your business from the fact cards that accompany this brochure.

IN THE ENVIRONMENT

MERCURY SWITCHES AND RELAYS



WHERE ARE THEY FOUND?

Mercury switches are found in a variety of items ranging from chest freezers to sump pumps. Mercury-containing tilt switches are found in or under the lids of clothes washers and chest freezers. They stop the spin cycle or turn on a light. They are also found in motion-sensitive and position-sensitive safety switches in clothes irons and space heaters. If a mechanical switch is not visible in these items, a mercury switch is probably being used. Float switches are commonly used in sump pumps and bilge pumps to turn the equipment on and off when the water is at a certain level. These switch devices are often visible.



Automobile trunk and hood light switches often contain mercury. If the light goes on when the lid is partway up, or if you can see that the bulb housing is deliberately mounted at an angle to the hood, a mercury switch is probably being used. A variety of manufacturing processes use

MERCURY-CONTAINING THERMOSTATS



Mercury-containing tilt switches have been used in thermostats for more than 40 years. They provide accurate and reliable temperature control, require little or no maintenance, and do not require a power source. However, each switch contains approximately 3 grams of mercury.



Mercury-free thermostats are available. Electronic thermostats, for example, provide many of the same features as mercury thermostats. Both types can be programmed to lower room temperatures at pre-set times. This results in fuel cost savings and the environmental benefits from burning less fuel.

HOW DO I DISPOSE OF MERCURY-CONTAINING THERMOSTATS?

Honeywell Corporation has a free take-back program to collect any brand of used mercury-containing thermostats, through

MERCURY THERMOMETERS



Some fever and laboratory thermometers contain mercury and should not be thrown in the trash. A typical fever thermometer contains about 0.5 grams of mercury. Larger laboratory thermometers can contain up to 3 grams of mercury.

Many thermometers used to measure air and water temperature also contain mercury, and they are used by homeowners, businesses, institutions, and recreational anglers. When these thermometers break outdoors, the mercury from them is difficult to capture.



Spirit-filled or digital thermometers are as accurate as mercury thermometers for most applications. Since they are mercury-free, no mercury will be released if they break in the home, laboratory or outdoors, or when they are thrown away. Digital thermometers last longer because they do not break. Consequently, they cost less in the long run.

relays to control power to heaters or pumps. Relays that contain mercury switches activate airbags, anti-lock brakes (primarily found in four-wheel drive vehicles), some seat belt systems, and some automatically adjusting suspension systems. Some agricultural equipment, military vehicles, mass transit vehicles, and fire hook and ladder equipment also contain mercury switches.

WHAT SHOULD I DO WITH THEM?

Remove switches from appliances or vehicles and store them in a covered container marked "Mercury Switches for Recycling." Take them to a consolidation site* or arrange with a transporter to take them. Contact your county or state environmental office or solid waste office for services available in your area. To protect yourself from future liability, save the invoices that track your wastes and include the following information:

- the date of shipment
- the amount of waste
- the location from where the wastes are being shipped
- the destination of the shipment

**These services may not be available in your area.*



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either a reverse distribution system or a recycle-by-mail system.* Here's how to use each system:

REVERSE DISTRIBUTION*

Contact your heating, ventilating, and air-conditioning (HVAC) wholesaler. Honeywell provides a special container for thermostats to each participating HVAC wholesaler. **DO NOT REMOVE THE SWITCHES FROM YOUR THERMOSTATS.** The wholesaler consolidates thermostats from heating contractors and mails them intact by United Parcel Service to Honeywell where the mercury bulbs are removed, bulked, and shipped to a mercury reclamation facility. Honeywell purchases mercury from that facility to use in new thermostats, thus closing the recycling loop for mercury.

RECYCLE-BY-MAIL*

Homeowners can call Honeywell at 1-800-345-6770, ext. 733* to request a free thermostat mailer. Honeywell sends a postage-paid pre-addressed envelope mailer that is lined with a bubble pack for extra protection. A plastic zipper bag is also provided. The customer seals the thermostat in the plastic bag, puts it in the envelope mailer, and drops it in the mail.

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Change to spirit-filled or digital thermometers whenever feasible. In the meantime, save old or broken mercury thermometers in a closed container. If a thermometer breaks, pick up all the mercury you can and add it to the container. Use two pieces of paper or two razor blades to scoop it up from a smooth surface. Use an eyedropper or a mercury vacuum to pick up pieces of mercury from the floor or the ground. Mercury spill kits are available from safety equipment supply companies for large mercury spills.

HOW DO I DISPOSE OF MERCURY THERMOMETERS?

Homeowners can use local household hazardous waste collection programs* for broken thermometers. Businesses should deliver discarded thermometers to a consolidation site* or arrange with a transporter to take them. Contact your county or state environmental office or solid waste office for services available in your area. To protect yourself from future liability, save the invoices that track your wastes and include the following information:

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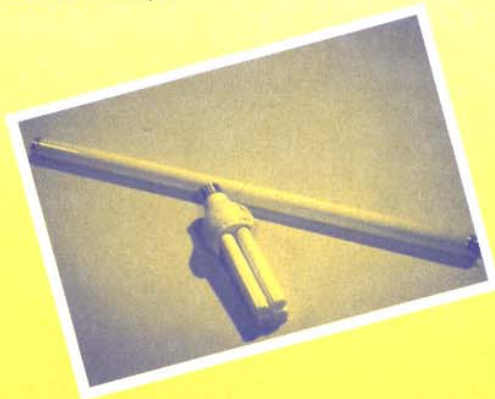
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FLUORESCENT & HIGH-INTENSITY DISCHARGE (HID) LAMPS



WHICH LAMPS CONTAIN MERCURY?

- fluorescent lamps
- mercury vapor lamps
- metal halide lamps
- high pressure sodium lamps
- neon lamps



WHY USE FLUORESCENT AND HID LIGHTING?

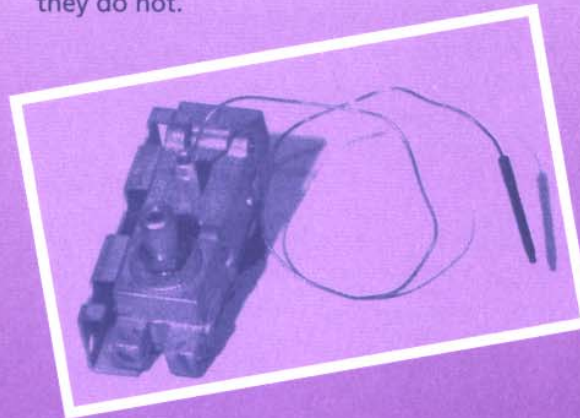
Fluorescent and HID lighting is an excellent business and environmental choice because it can use up to 50 percent less electricity than incandescent lighting. However, used fluorescent and HID lamps must be managed properly because they contain mercury.

MERCURY-CONTAINING THERMOSTAT PROBES



WHERE ARE THEY FOUND?

Mercury-containing thermostat probes may be found in several types of gas-fired appliances that have pilot lights, such as ranges, ovens, clothes dryers, water heaters, furnaces, or space heaters. The metal probe consists of a metal bulb and thin tube attached to a gas-control valve. The mercury is inside the tube and expands or contracts to open and shut the valve. Although non-mercury thermostat probes have been used in these appliances, you should treat all probes as though they contain mercury, unless you know that they do not.



Mercury thermostat probes, also known as flame sensors or gas safety valves, are most commonly present as part of the safety valve that prevents gas flow if the pilot light is not lit. In this application the bulb of the thermostat probe projects into or near the pilot light. These are commonly present in gas ovens and may be present in

GAUGES: MANOMETERS, BAROMETERS, VACUUM GAUGES



Many barometers and vacuum gauges found in machinery contain mercury. Liquid mercury in the gauges responds to air pressure in a precise way that can be read on a calibrated scale. Several mercury-free alternatives are available. Some operate on the same principle as mercury gauges but use mercury-free liquids in the tube.



Needle or bourdon gauges operate under a vacuum with a needle indicator. Electronic gauges can be used to measure pressure, but they must be calibrated with a mercury manometer. Equipment manufacturers recommend that service technicians use a needle or digital gauge to test the systems they are servicing, but that they calibrate the gauges they use in the field with a mercury manometer kept at their shop.

Mercury manometers occasionally need servicing to maintain their accuracy, and

HOW DO I DISPOSE OF THE LAMPS?

- Store lamps in an area and in a way that will prevent them from breaking, such as in boxes the lamps came in or boxes supplied by lamp recyclers.
- Mark the lamp storage area with the words "Fluorescent lamps for recycling."
- Do not break or crush lamps because mercury may be released.
- If lamps are accidentally broken, store them in a sealed container. Pick up spilled powder and add it to the sealed container.
- Take lamps to a consolidation site* or arrange with a lamp transporter to pick them up. Contact your county or state environmental office or solid waste office for services available in your area. To protect yourself from future liability, save the invoices that track your lamps and include the following information:
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any other appliance with a pilot light. A mercury thermostat probe may also be present as part of the main temperature-controlling gas valve. In this application, the probe is in the air or water that is being heated and is not directly in contact with any flame. These are typically found in older ovens, clothes dryers, water heaters, and space heaters.

WHAT SHOULD I DO WITH THEM?

Remove thermostat probes from the appliances you process and store them in a covered container marked "Mercury Thermostat Probes for Recycling." Take them to a consolidation site* or arrange with a transporter to take them. Contact your county or state environmental office or solid waste office for services available in your area. To protect yourself from future liability, save the invoices that track your wastes and include the following information:

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elemental mercury often remains as a waste. If the manometer is hard to read because of dirt and moisture in the tube, the mercury needs to be removed and replaced.

HOW DO I DISPOSE OF MERCURY FROM GAUGES?

Store mercury waste from servicing manometers and other mercury-containing gauges in a covered, air-tight container that will not break. Smaller vials can be stored in a larger covered, air-tight container, such as a five-gallon plastic pail.

Take the vials of liquid mercury to a consolidation site* or arrange with a transporter to take them. Contact your county or state environmental office or solid waste office for services available in your area. To protect yourself from future liability, save the invoices that track your wastes and include the following information:

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