State of Ohio
Environmental Protection Agency

Fact Sheet

Fluorescent Lamps

April 2000

Our use of the term "lamp" or "fluorescent lamp" applies generically to mercury-containing lamps including: metal halide, high-pressure sodium, and mercury-vapor lamps. Fluorescent lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Lamps may also contain lead and small amounts of antimony, cadmium, and manganese. Lamps could potentially exhibit the characteristic of toxicity for any of the metals when disposed. Ohio EPA encourages businesses to recycle their lamps. If you recycle your lamps, as a business, you do not need to managed them as hazardous waste. However, if your businesses discard its lamps, you must determine if they exhibit any characteristic of a hazardous waste and manage them accordingly. Although manufacturers of lamps have decreased the amount of mercury contained in them over the past several years to less than 20 mg, lamps may still pose a health risk.

Fluorescent lamps require ballasts and capacitors for proper operation. A fluorescent light ballast electrically controls fluorescent light fixtures and includes a capacitor containing 0.1 kg or less of dielectric fluid. Either "dry" or "wet" capacitors compose the ballasts. Wet capacitors produced before 1978 may contain polychlorinated biphenyls (PCB), toxic liquid insulation material. Companies discontinued the production of PCB-containing ballasts in 1978. Dry capacitors do not contain a fluid insulation medium.

How Does the Characteristic of Toxicity Apply to Lamps?

Ohio EPA uses the Toxicity Characteristic Leaching Procedure (TCLP) to determine if a solid waste exhibits the characteristic of toxicity. When TCLP results indicate a level of mercury greater than 0.2 parts per million (ppm), a lamp exhibits the toxicity characteristic. Your business must use either knowledge of the waste or TCLP results to determine if the waste meets any characteristic of a hazardous waste. As stated previously, any of these lamps may be hazardous for other heavy metals.

How do I Manage my Lamps?

Lamp Recycling

Virtually an entire fluorescent lamp can be recycled, including end caps, glass tube, wire, mercury and phosphor powder. Glass products may incorporate glass from fluorescent lamps as feedstock to manufacture glass products. Lamp recyclers often sell the metallic portion as scrap metal. These recyclers recover mercury by retorting the lamps. After further purification industries may reuse the mercury in thermometers, barometers, and electronic devices. By recycling lamps, natural resources will be conserved. Lamps that are properly collected and recycled are not subject to the hazardous waste requirements. You should retain documentation showing that your company's lamps were recycled. This information may include bills of lading, service agreements and billing statements, etc. For further recycling information, view the Division of Hazardous Waste Management or the Office of Pollution Prevention websites at *www.epa.state.oh.us.*

Fluorescent Lamp Management Tips

- Recycle fluorescent lamps where possible.
- Keep lamps intact. Broken lamps may lead to exposure to mercury. Broken lamps should still be recycled. However if they are not acceptable to the recycling facility, they must be evaluated to determine if they are hazardous waste.
- Segregate ballasts containing PCBs from those that do not contain PCBs.
- Place lamps in protective packaging.
- Store lamps in a secure area and limit access to personnel qualified to handle them.
- Remove and discard residues from broken lamps promptly. Personnel cleaning up spills should have appropriate training.
- Characterize the fluorescent lamps if disposal is necessary. Appropriate TSD should manage them as hazardous waste.

Division of Hazardous Waste Management, P.O. Box 1049, Columbus, Ohio 43216-1049 (614) 644-2917
Office of Pollution Prevention, (614) 644-3469

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Lamps Destined for Recycling Are Not Hazardous Waste

DHWM classifies used (burnt out) lamps that exhibit a characteristic of a hazardous waste as characteristic by-products. Unused lamps (i.e. defective) are classified as off-specification commercial chemical products. According to OAC rule 3745-51-02 (C)(3), characteristic by-products and off-specification commercial products that are reclaimed are not wastes; therefore, Ohio's hazardous waste rules do not apply to these lamps. However, if the recycling facility uses any of the hazardous constituents contained in the lamps as ingredients in a product or as a substitute for a product, which will be used on the land, such use constitutes disposal of a waste. In this case, fluorescent lamps become wastes when generated. OAC rule 3745-51-02 (C)(i) and (ii) illustrates this situation. Your business must know the end use of all parts of its lamps. If any part of a characteristic by-product (lamp) is used on the land, then it is a waste subject to the hazardous waste requirements when generated.

Generator Responsibilities

DHWM strongly discourages you from crushing your company's lamps. Lamp crushing increases the potential for the release of mercury into the environment. Releases may occur because of the unique properties of mercury. Unlike other metals, mercury is a liquid at room temperature. Mercury also vaporizes or may be inhaled at room temperature. (Some recycling companies may not accept broken or crushed lamps.) If a recycler will not accept the lamps, then they must be evaluated to determine if they are hazardous waste. If the lamps exhibit a characteristic of a hazardous waste, your company must manage them accordingly and dispose of them at a permitted hazardous waste facility.

Your company must follow the appropriate hazardous waste rules for lamps that will be transported to a hazardous waste treatment, storage, or disposal facility (TSDF) which will not be reclaiming them. In this situation, the hazardous waste rules apply to a hazardous waste at its point of generation. Your company must also follow these rules if lamp components will be used in a manner which constitutes disposal.

If your company is a small quantity generator (SQG) (generate between 100 and 1000 kg of hazardous waste/month) or a large quantity generator (LQG) (generates over 1000 kg of hazardous waste/month) of hazardous waste, these rules include obtaining a hazardous waste identification number, properly storing the hazardous waste prior to shipment, using a hazardous waste manifest and using a hazardous waste transporter. The appropriate documentation indicating that the lamps are not hazardous wastes must be maintained on file for lamps that will be disposed of in a municipal solid waste stream.

Recycling Facility Responsibilities

Ohio EPA does not require the owner/operator of a recycling facility to obtain a hazardous waste installation and operation permit for treating or storing lamps before recycling them. The owner/operator of the facility must characterize any waste generated and manage it accordingly. However, the owner/operator may need to obtain an air permit from Ohio EPA Division of Air Pollution Control (DAPC).

Ohio EPA mandates a specific time frame in which lamps destined for recycling must be recycled. Recyclable lamps may become regulated hazardous waste if they are "speculatively accumulated" as defined in OAC rule 3745-51-01 (C)(8). If at least 75 percent of the lamps present at the beginning of a calendar year are recycled by the end of that year, a facility is not considered to be speculatively accumulating them.

For further information regarding hazardous waste requirements, contact Ohio EPA, DHWM at (614) 644-2934. DAPC may be contacted at (614) 644-2270 for questions relating to possible mercury emissions.

Lamp Disposal

When lamps are discarded, they become subject to the requirements of Ohio's hazardous waste management rules. These rules regulate the management of hazardous waste from its generation through its disposal. Lamps destined for disposal are considered to be wastes as defined in the Ohio Administrative Code (OAC) rule 3745-51-02. OAC rule 3745-52-11 requires a generator of a waste to determine if that waste is hazardous.

A waste that exhibits a characteristic of a hazardous waste, as identified in OAC rules 3745-51-20 to 3745-51-24 meets the definition of a hazardous waste. Ignitability, reactiv-

ity, corrosivity, and toxicity make up the four characteristics of a hazardous waste. A waste may also be hazardous if it is listed in OAC rules 3745-51-30 to 3745-51-33. Although Ohio's hazardous waste rules do not include lamps as listed hazardous wastes, they may exhibit the characteristic of toxicity, primarily resulting from mercury content. Other heavy metals such as lead may cause the lamp to exhibit the characteristic of toxicity.

It is important to note that Ohio's hazardous waste regulations do not include hazardous waste produced by homeowners. OAC rule 3745-51-04 (B)(1) details the household hazardous waste exemption.

How Does the Universal Waste Rule (UWR) Relate to Fluorescent Lamp Management?

U.S. EPA added fluorescent lamps to its UWR on July 6, 1999 (FR 64 36466). Ohio EPA still maintains its characteristic by-product determination. In the future, Ohio EPA will adopt fluorescent lamps into its UWR.

How Do I Manage My Ballasts?

The Toxic Substance Control Act (TSCA) regulates PCB management, including disposal. TSCA regulates the manufacture, sale, use and disposal of certain chemical substances. This regulation requires prescreening, testing, record keeping and tracking of specific chemical products.

For additional information concerning TSCA, contact U.S. EPA, Region V, PCB Control Section at (312) 886-7061. For assistance concerning reportable quantity requirements, contact the Division of Emergency and Remedial Response at (614) 644-2924.

Recycling

Ohio EPA encourages recycling, where possible. PCB-containing ballast recycling separates the PCB capacitor from the uncontaminated materials. PCB materials are sent for destruction in a PCB incinerator, while metals (copper, steel and aluminum) are recycled.

What is the Energy Star Buildings and Green Lights Program?

U.S. EPA initiated the "Green Lights" program, a public/private partnership, in 1991 to encourage industries and businesses to replace outdated lighting with more efficient lighting.

The U.S. EPA Energy Star program offers information on energy reduction through product choices. This program offers a list of products with the energy-star label that use less energy than other products. Energy Star offers voluntary partnerships for businesses which promote energy efficiency, reduce air pollution, and save money.

For publication and program information, contact the Green Lights/ Energy Hotline at 888-STAR-YES or view the website at *www.epa.gov/ energystar.html* or fax requests to (202) 775-6680.

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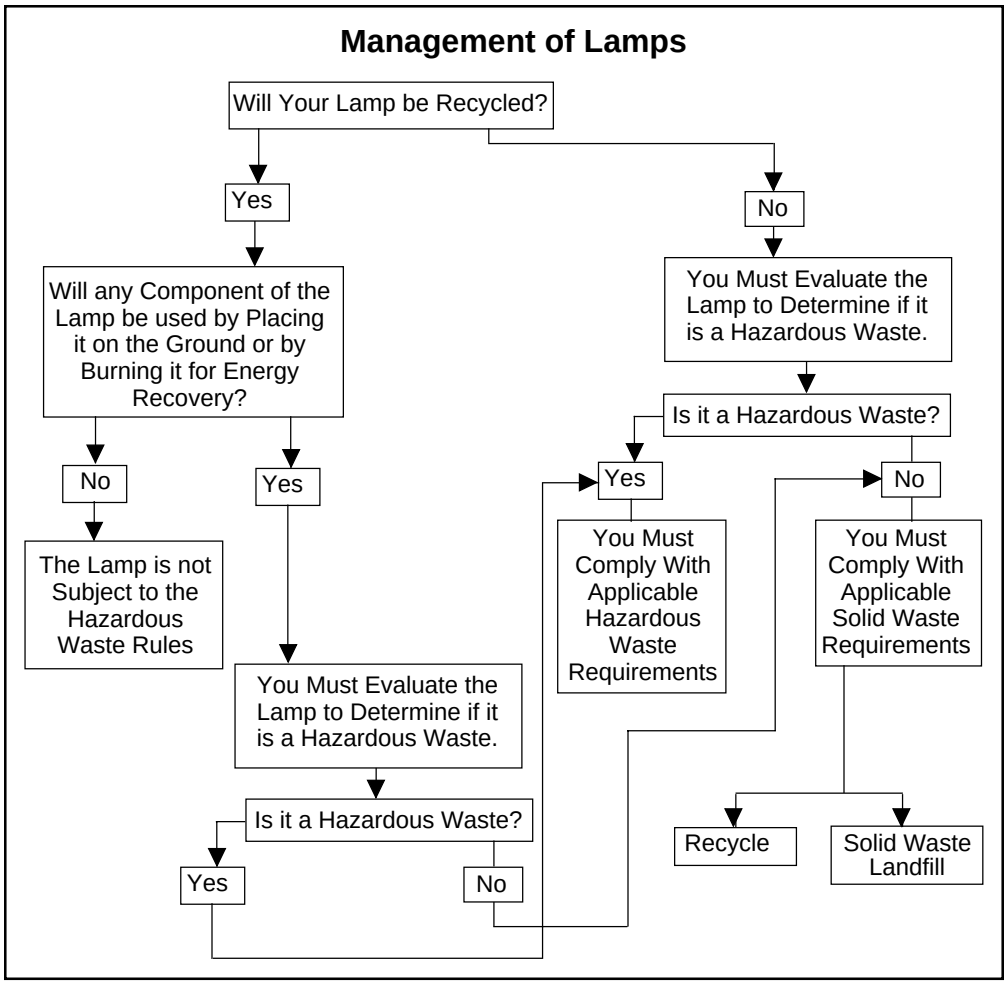

Ohio EPA District Offices

Central District Office
3232 Alum Creek Drive
Columbus, Ohio 43207-3417
(614) 728-3778

Northeast District Office
2110 Aurora Road
Twinsburg, Ohio 44087
(330) 425-9171

Northwest District Office
347 North Dunbridge
Bowling Green, Ohio 43402
(419) 352-8461

Southeast District Office
2195 Front Street
Logan, Ohio 43138
(740) 385-8501

Southwest District Office
401 E. Fifth Street
Dayton, Ohio 45402-2911
(937) 285-6357

This fact sheet is a joint effort between the Office of Pollution Prevention (OPP) and the Division of Hazardous Waste Management (DHWM). For a listing of OPP and DHWM publications, contact (614) 644-2934.