

## USED ELECTRIC LAMPS & SMALL BALLASTS

Electric lamps or bulbs include fluorescent, high intensity discharge (HID), sodium vapor or high pressure sodium, mercury vapor, neon, metal halide, and incandescent lamps. Cathode ray tubes (CRTs) from computers, televisions, etc may be handled as either electric lamps or consumer electronics [universal waste](#). Some vehicle headlights are HID lamps. Residents and companies and other facilities are encouraged to buy lamps with the lowest mercury content that meet their lighting needs. Information about environmental purchasing can be found at [www.michigan.gov/deqp2initiatives](http://www.michigan.gov/deqp2initiatives) and at [www.informinc.org/fact\\_P3mercury\\_lamps.php](http://www.informinc.org/fact_P3mercury_lamps.php).

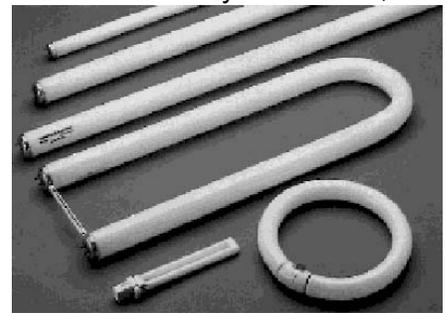
### I. How should residents manage used lamps?

Households are exempt from the hazardous waste regulations, but residents are encouraged to:

- ◆ Avoid breaking lamps so mercury will not be released.
- ◆ Package lamps carefully when storing & transporting them. Check with the household hazardous waste program or recycler you plan to use for packaging recommendations. Contact your [local recycling coordinator](#), [local household hazardous waste collection](#), or go to [www.earth911.org](http://www.earth911.org) to find recycling options. Not all programs accept used lamps at this time so encourage your program to consider taking them.
- ◆ Dispose of lamps with other household trash only if the garbage hauler and landfill will accept them. Contact them for more information, but **MDEQ strongly recommends that lamps are safely recycled whenever possible.**

### II. How do companies and regulated facilities know lamps are hazardous waste?

- ✓ All generators of waste, except households, must determine by knowledge and/or testing if their waste lamps are hazardous waste. Keep characterization records at least 3 years after the last shipment. Characterization of the lamps can be done by:
  - ▶ **Obtaining lamp maker's written claim that states the lamps are, or are not, hazardous waste.** Contact the lamp supplier or manufacturer to get a Material Safety Data Sheet (MSDS) or advertising literature that has this information. Some MSDS are available on the Internet. The information may include words such as "lamps are not a RCRA waste", "lamps are not a Resource Conservation and Recovery Act waste", "lamps are a non-haz waste", or "lamps are not a hazardous waste". Lamps that are not hazardous waste usually have green lamp etching or green components like green end caps. They are often called green tipped or low mercury bulbs. These "green bulbs" still contain mercury but are designed so they pass the test used to characterize hazardous waste for toxicity.
  - ▶ **Assuming they are hazardous.**
  - ▶ **Having them tested using Toxicity Characteristic Leaching Procedure (TCLP).** Used lamps are considered hazardous waste when:
    - Mercury concentration  $\geq 0.2$  mg/L; would have D009 waste code. (*fluorescent lamps, sodium-vapor lamps, high- and low-pressure mercury vapor lamps, and HID lamps*)
    - Cadmium concentration  $\geq 1$  mg/L; would have D006 waste code. (*incandescent bulbs*)
    - Lead concentration  $\geq 5$  mg/L; would have D008 waste code. (*incandescent bulbs and color CRTs*)



**☒ Not properly characterizing lamps and keeping records are common violations.**

### III. What are the regulations for managing a company's waste lamps?

Michigan companies are encouraged to follow the [universal waste rule](#) (R 299.9228) which adopts many of the [federal universal waste regulations](#). The management requirements will depend on the amount of all universal waste at the site — most companies are small quantity handlers (SQH); but if a company has more than 11,000 lbs of all universal wastes at any time, then they must meet large quantity handler (LQH) requirements. That is equivalent to about 17,000 four foot lamps if lamps are the only universal waste on-site. Other universal waste includes batteries, electronic equipment, mercury switches, thermometers, thermostats and other devices containing elemental mercury, certain pesticides, and pharmaceuticals. This guidance provides a summary for handling lamps.

Another option for the company is to follow the hazardous waste regulations for handling, storage, treatment and disposal ([Part 111 of Michigan's Natural Resources and Environmental Protection Act, 1994 P.A. 451, as amended \(P.A. 451\) and rules](#), and [Subtitle C of the Federal Resource Conservation and Recovery Act \(RCRA\) of 1976, as amended regulations](#).) The specific requirements will depend on a company's hazardous waste generator status — large quantity, small quantity, or conditionally exempt small quantity generator.

#### Hazardous Waste Generator Status Categories

In ONE month, the total amount of ALL nonacute hazardous waste is generated and accumulated at the following volumes:

**Large Quantity Generator (LQG):** more than 2,200 pounds [and/or more than 2.2 pounds of acutely and severely toxic hazardous waste is generated.]

**Small Quantity Generator (SQG):** 220 pounds to less than 2,200 pounds. Accumulation never exceeds 13,200 pounds.

**Conditionally Exempt Small Quantity Generator (CESQG):** less than 220 pounds. Accumulation never exceeds 2,200 pounds.

There are also storage time limits and other requirements. See the [Waste Characterization](#) guidance. Contact the DEQ Environmental Assistance Center at 800-662-9278 or your local [DEQ Waste and Hazardous Materials Division district office](#), or download hazardous waste guidance at [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste) for more hazardous waste information. The electronic federal regulations are at [www.gpoaccess.gov/cfr/index.html](http://www.gpoaccess.gov/cfr/index.html)

### IV. How must used lamps be stored at companies?

✓ **Store lamps in containers that are kept closed and handled to minimize breakage during normal conditions.**

- ▶ Place waste lamps in sturdy packaging or containers. If going to be used for shipment, have it functionally equivalent to that used to ship new lamps. Some recyclers may provide shipping containers. A company could make a storage unit to hold the bulbs until the hauler arrives. Check with the recycler before applying tape around the lamps and to determine what kind of packaging they want used.

- ▶ It is recommended to seal full packages with tape.

**⊗ Improper storage, such as leaning lamps against a wall, placing them behind doorways, stuffing them in rafters, storing outdoors, and throwing them in dumpsters when not allowed, are common violations.**

✓ **Do not exceed the accumulation time limits.**

- ▶ If managing lamps as universal waste, store no longer than one year. If a longer time period is needed to economically collect the bulbs for recycling, discuss with the Waste and Hazardous Materials Division District Office if an extension can be granted. Document the time period by any of the following:

- Date the container when the first waste bulb was put into it, or date the electric lamp,
- Keep a log or inventory, or
- Use another method to demonstrate how long the universal waste has been accumulated.



Example of one type of universal waste storage. End cap removed for taking picture.

- ▶ If managing lamps as hazardous waste, they may be kept on-site up to:
  - 90 days for large quantity generators (LQG).
  - 180 days (or 270 days if shipping over 200 miles) for small quantity generators (SQG).
  - Conditionally exempt small quantity generators (CESQG) do not have a time limit unless all hazardous waste on-site exceeds 2,200 pounds. If a CESQG would like to manage their bulbs as universal waste, but don't accumulate enough in one year to make it affordable, the DEQ allows placing the universal waste labeling on the accumulated waste so employees are aware of the company's recycling efforts. As a CESQG, there is no annual restriction on storing hazardous wastes when the total accumulation is below 2,200 pounds. When the quantity reaches an effective, efficient recycling amount, you can re-designate the waste as universal and ship it out.

✓ **Properly label waste lamps.**

- ▶ If managing lamps as universal waste, label with any of these terms:
  - **“Universal Waste Electric Lamps”**
  - **“Waste Electric Lamps”** or
  - **“Used Electric Lamps”**

*Note that Michigan's universal waste labeling requirements are more stringent than federal regulations.*

- ▶ If managing lamps as hazardous waste, label the container with the words **“Hazardous Waste,”** the date the lamp was first put in container, and the waste code(s). There are additional labeling requirements for shipment. See guidance for waste generators.

**⚠ Improper labeling is a common violation.**



**V. What if a hazardous lamp accidentally breaks?**

If lamps are accidentally broken, the *National Electrical Manufacturers Association* recommends the following:

- ✓ Ventilate the area where breakage occurred.
- ✓ Take usual precautions for the collection of broken glass.
- ✓ Do not use a standard vacuum cleaner.
- ✓ Place materials in a closed container to avoid generating dust.

See more mercury spill response information at [www.michigan.gov/degmercuryp2](http://www.michigan.gov/degmercuryp2) including tips about what to have in a mercury spill kit. If more than 1 pound of mercury is released (approximately 2 tablespoons), report the incident by calling PEAS at 800-292-4706.

When lamps are accidentally broken:

1. Evaluate your storage methods to avoid breakage in the future.
2. Determine if the residue is hazardous waste and handle according to your hazardous waste generator status.
3. Properly dispose of the waste. Check with the recycler if they will take broken bulbs.
4. Call the [Waste and Hazardous Materials Division District Office](#) with questions about management requirements.

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## VI. Is training required for employees who handle waste lamps?

Both the universal waste and hazardous waste rules for SQG and LQG require handling and release response training for employees who manage used lamps. The training should be relevant to their responsibilities for handling the waste and include information about what to do if lamps are broken. See the above mercury spill information and check the MSDS for recommended handling procedures and safety equipment to have available. The DEQ does not provide this type of training. If the company is a LQG and handling bulbs as hazardous waste, incorporate this information in the company's [written contingency plan](#) and [training program](#).

## VII. What are the disposal options for electric lamps?

**MDEQ recommends that all hazardous and non-hazardous lamps be safely recycled.**

### 1. Ship the spent universal waste lamps to a recycler or another universal waste handler.

- ◆ For criteria to consider when choosing a recycler, go to [www.lamprecycle.org](http://www.lamprecycle.org) and [www.almr.org](http://www.almr.org). Be aware that there is no such thing as an “EPA or DEQ certified recycler” of any kind. Unfortunately, a number of electronic waste recyclers are using this term to signify they have notified WHMD that they are a large quantity universal waste handler.
- ◆ To find recyclers, go to the [Recycled Materials Market Directory](http://www.michigan.gov/deqrmmd) at [www.michigan.gov/deqrmmd](http://www.michigan.gov/deqrmmd) and select the Glass category to search by the type of bulb. You can also do an advanced search in the [Waste Data System](#) (WDS) for Universal Waste destination facilities under the heading “Hazardous & Liquid Industrial Waste Site Activity Information.” If you search for Large Quantity Handlers in WDS, be aware not all of them accept waste from other handlers. If shipping to another universal waste handler, make prior arrangements with them to confirm that they will accept the lamps.
- ◆ Contact the [local household hazardous waste collection program](#) to see if they accept universal waste lamps from entities besides residential customers. Not all programs accept lamps.
- ◆ Meet the U.S. Department of Transportation (US DOT) requirements. Packages of universal waste lamps containing mercury are only regulated when transported by air. If being shipped through or to states that do not recognize them as universal waste, contact that state for requirements, and call US DOT at 800-467-4922 or see US DOT information at [hazmat.dot.gov](http://hazmat.dot.gov). Questions about hazardous materials transportation in Michigan can be directed to the Michigan State Police, Motor Carrier Division at 517-336-6580.
- ◆ If the shipment is within Michigan, it does not require the use of permitted and registered hazardous waste transporter or waste manifest. A permitted and registered transporter and manifest must be used if the lamps are being sent to or through other States that do not regulate them as universal waste.
- ◆ Additional requirements for large quantity handlers of universal waste:
  - Obtain a site identification number if the company doesn't already have one. If necessary update information previously submitted to the Waste and Hazardous Materials Division to include the notification the company is a large quantity handler. Apply online by using the [Michigan Timely Application and Permit Service \(MiTAPS\)](#) at [www.michigan.gov/mitaps](http://www.michigan.gov/mitaps) or submit the [form EQP 5150](#). Use the [Waste Data System \(WDS\)](#) to confirm if a company has an identification number or what activities the company has on file.
  - Keep records of the universal waste shipments for at least 3 years from date of shipment. It can be a log, invoice, bill of lading, or other shipping document. It must contain the following information:
    - Name and address of universal waste handler or destination facility where the universal waste is being shipped
    - Quantity of each type of universal waste in the shipment
    - Date of shipment
- If the universal waste is being exported out of the country or imported into the United States, there are additional requirements including certifications and annual reports. See the [federal universal waste regulations](#) and contact EPA International Compliance Assurance Division at 202-564-4108.

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## 2. Ship the spent hazardous waste lamps to a recycler or disposal company.

- ◆ If handling the lamps as hazardous waste, a SQG or LQG must:
  - ☞ Hire a [permitted and registered hazardous waste transporter](#).
  - ☞ Obtain a site identification number if the company doesn't already have one. Apply online by using the [Michigan Timely Application and Permit Service \(MiTAPS\)](#) at [www.michigan.gov/mitaps](http://www.michigan.gov/mitaps) or submit the [form EQP 5150](#). Use the [Waste Data System \(WDS\)](#) to confirm if a company has a site identification number or what information is on file.
  - ☞ Meet all the applicable hazardous waste regulations for the company's hazardous waste generator status. This includes manifesting requirements, submitting land disposal restriction paperwork, record keeping, etc.
- ◆ A CESQG should contact the recycler or disposal company for shipping requirements.
- ◆ A CESQG may want to check if the [local household hazardous waste collection program](#) will accept used lamps. Not all programs accept lamps.
- ◆ Meet US DOT requirements if the package is a US DOT hazardous material. The company would need to meet applicable [hazardous materials requirements](#) such as placarding, shipping papers, containers, etc. Hazardous waste packages containing less than 1 lb of mercury are not regulated as [US DOT hazardous material](#) when shipped by highway.

Most lamp packages are not large enough to contain 1 lb of mercury. The amount of mercury in each bulb depends on brand and length. Four foot fluorescent lamps may contain between 15 and 50 mg of mercury per tube. More transportation information is at [hazmat.dot.gov](http://hazmat.dot.gov); or call the Michigan State Police, Motor Carrier Division at 517-336-6580 or US DOT at 800-467-4922.

## 3. Hire a recycling company that comes to your company and processes the lamps on-site.

- ◆ Manage the lamps either as universal waste or hazardous waste while they are on-site.
- ◆ Clarify in the contract the company's and recycler's responsibilities. Once lamps are crushed, they can no longer be managed as universal waste. Usually once the lamps are processed, the recycling company assumes responsibility for any further hazardous waste management requirements provided the recycler takes the crushed lamps and other residues with them.
- ◆ Characterize any residue, including crushing filters, that may be left at the site to determine if it is hazardous waste or not. The company needs to manage the hazardous residue according to their hazardous waste generator status requirements.

## 4. Although not recommended, lamps under certain conditions listed below, including the type of lamp and the company's hazardous waste generator status may be disposed of in licensed municipal solid waste landfills if the landfill authority and waste hauler will accept them. Although some companies may use landfill disposal as an option, MDEQ recommends all lamps be safely recycled.

- ◆ Check with the local landfill authority if they accept the following lamps:
  - Lamps characterized as non-hazardous
  - Lamps that are hazardous waste that were generated by CESQG
  - Lamps from households
- ◆ Be aware the company generating the waste lamps may have future liability cleanup costs if the landfill becomes contaminated since the lamps still contain mercury and heavy metals.
- ◆ SQGs and LQGs CANNOT send lamps to landfills if they are characterized as hazardous waste or universal waste. If putting lamps in the trash, make sure to have documentation that they are not hazardous waste.

**☒ Disposal in the trash when it is not allowed is a common violation.**

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## VIII. Can lamps be crushed?

**MDEQ strongly discourages crushing spent electric lamps because it may pose health and environmental risks.** Most of the mercury in lamps is in the vapor state. Crushing releases it to the environment, which may also be a significant hazard to employees. If the company decides it wants its bulbs crushed, often because of limited storage space, it will need to:

- ✓ Obtain an air permit from the Air Quality Division. Discuss requirements with the Air Quality Division [District Office](#).
- ✓ Meet the additional waste management requirements under [R 299.9503\(1\)\(i\)](#) and [referenced federal rules](#). A permit is not required from the Waste and Hazardous Materials Division when crushing a company's own lamps in accordance with R 299.9503(1)(i). Discuss questions about the following waste requirements with your Waste and Hazardous Materials Division District Office:
  - ▶ Proper container management and inspections
  - ▶ Secondary containment installation and maintenance
  - ▶ Emergency preparedness and prevention requirements
  - ▶ Additional record keeping
- ✓ Characterize the wastes generated from the crushing or recycling process, including the crushing unit filters. Once lamps are crushed, the residue can no longer be managed as universal waste.
- ✓ Meet the federal [land disposal restriction](#) requirements for crushed lamp residue that is hazardous waste. Discuss these requirements with the disposal company.
- ✓ Comply with applicable MIOSHA requirements for worker safety and protection from mercury exposure. Discuss requirements with the [Department of Labor and Economic Growth, MIOSHA](#) at 517-322-1809.
- ✓ Check if your [lamp recycler](#) can accept broken or crushed lamps. Some do not or may charge more to recycle them.
- ✓ If you handle other companies' lamps, there are more waste requirements that are not summarized in this document. Discuss additional requirements with the Waste and Hazardous Materials Division.

## IX. If re-lamping a site, are there any special requirements?

Businesses with less than 500 employees may want to consider having a [RETAP assessment](#) done at the company before beginning a re-lamping project. This free service might identify cost saving opportunities.

If a company is installing different light fixtures, meet all the handling and disposal requirements discussed previously and also consider:

- If the lamps are being handled as hazardous waste, determine if the amount of lamp waste changes the hazardous waste generator status. If it does, re-notify the Waste and Hazardous Materials Division by using the [Michigan Timely Application and Permit Service \(MiTAPS\)](#) at [www.michigan.gov/mitaps](http://www.michigan.gov/mitaps) or submit the [form EQP 5150](#), and meet the additional hazardous waste regulations for that generator level.
- If lamps are being handled as universal waste, determine if the amount of lamp waste changes the universal waste handler status. There are additional requirements if managing 11,000 pounds or more of all universal waste at any one time. Universal waste lamps will not affect your hazardous waste generator status.
- If a company is hiring a contractor to do the re-lamping, both the company and the contractor would be considered co-generators of the waste, and will be jointly and severally liable as waste generators. EPA and DEQ recommend that when two or more parties meet the definition of generator they should mutually agree to have one party perform the generator duties and this should be identified in a contract.

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## **X. If buildings are demolished or remodeled, are there any special requirements?**

It is recommended all lamps and ballasts be removed, and in some situations required:

- A LQG and SQG must remove lamps and ballasts that are characterized as hazardous waste and all other hazardous waste before demolition or renovation projects.
- A company that is normally a CESQG must remove bulbs and ballasts that are hazardous waste if they generate 220 pounds or more of hazardous waste in that calendar month because they have exceeded the CESQG generation limit.
- In areas where hazards exist, meet the general requirement under [MIOSHA Standard Part 20 Demolition](#) rule 408.42031. Call MIOSHA Consultation, Education, and Training Division at 517-322-1809 with any questions.

Depending on the amount of debris and the number and type of light fixtures, it may affect the characterization of the demolition debris if the lamps had not been removed. It may be necessary to test the debris to determine if the waste would be a characteristic hazardous waste. Discuss your situation with the disposal company and the [Waste and Hazardous Materials Division District Office](#).

Meet the Air Quality Division and Department of Labor and Economic Growth [asbestos requirements](#), including submittal of the Notification of Intent to Renovate/Demolish form. Contact the DEQ Asbestos Program at 517-373-7064 for additional information about asbestos requirements.

## **XI. How are small capacitors and ballasts from fluorescent light fixtures handled?**

If small capacitors and ballasts are intact, non-leaking, and contain less than 50 ppm polychlorinated biphenyls (PCBs), they may be disposed of in a licensed landfill, if the landfill authority will accept them. Some ballasts will have "No PCBs" on the label. Contact the landfill about their acceptance policy. If a company is doing a re-lamping project or getting rid of a number of devices at one time, the landfill may not take them. It is recommended to pack the devices in an US DOT approved drum with adequate absorbent such as sawdust or soil to absorb any potential liquid in the device and label the container. If no free liquids are present, there are no manifesting requirements.



If the devices are leaking, or contain 50 ppm PCBs or more, or you need a list of PCB disposal sites, or more information about PCBs in devices, see the federal information at [www.epa.gov/pcb](http://www.epa.gov/pcb). It covers disposal requirements under the Toxic Substances Control Act (TSCA) and lists of disposal and treatment companies. Also see the DEQ guidance about [PCBs in fluorescent light fixtures](#).

This guidance was revised August 2006 by the Environmental Science and Services Division in conjunction with the Waste and Hazardous Materials Division and Air Quality Division Toxics Unit. Regulations are subject to change. Reliance on information from this document is not usable as a defense in any enforcement action or litigation. Refer to the regulations or discuss your requirements with the regulating agency, or contact the Environmental Assistance Center at 800-662-9278.

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