



Lamp Wastes

Many commonly used lamps contain small amounts of mercury and other metals. Such lamps include fluorescent, compact fluorescent, high-pressure sodium, mercury vapor and metal halide lamps. Used lamps are a Resource Conservation and Recovery Act (RCRA) hazardous waste if the material exhibits the characteristic of toxicity for these metals. According to the Environmental Protection Agency (EPA), testing of burned-out fluorescent lamps showed that a high percentage of the lamps tested exhibited the toxicity characteristic for metals, particularly mercury.

Which lamps are not regulated as hazardous waste?

Mercury-containing lighting wastes are not regulated as hazardous wastes if they are generated by households or other residential sources. "Household" includes single-family homes, apartments, hotels and motels, retirement homes, bunkhouses, ranger stations, crew quarters, picnic areas, campgrounds, and day-use recreation areas. Residential wastes may be recycled, disposed of through a local household hazardous waste collection facility, or if these options are not available, disposed of in a municipal solid waste landfill. A list of household hazardous waste collection facilities can be found on the Hazardous Materials and Waste Management Division's web site.

Several lighting manufacturers now produce toxicity test-compliant versions of their products. Testing done by the manufacturers demonstrate that these lamps do not tend to fail the toxicity test for metals and can therefore be managed as non-hazardous solid wastes, even by non-residential facilities. Toxicity test-compliant lamps are clearly marked with either green printing or green end caps to distinguish them from other lighting products. Mercury-containing lighting wastes from non-residential sources that do not fail the toxicity test may be disposed of in a properly managed municipal solid waste landfill or sent to a legitimate lamp recycler. Landfills and recyclers may impose their own restrictions to regulate incoming wastes in accordance with local rules or company guidelines.

Which lamps are regulated as hazardous wastes?

While household wastes are exempt from the Colorado Hazardous Waste Regulations, non-residential sources like businesses, schools and government agencies must

determine if their lighting wastes are hazardous wastes.

If, using the Toxicity Characteristic Leaching Procedure (TCLP) test, the extract from a representative sample of the waste contains mercury at a concentration greater than or equal to the maximum contaminant concentration of 0.2 ppm (mg/l), the lamps would be hazardous waste. This waste would carry the hazardous waste code D009. Many mercury-containing lamps also contain elevated levels of lead and may exhibit the toxicity characteristic for lead as well (TCLP > 5 ppm lead). Such wastes would also carry the hazardous waste code D008. Non-residential sources of hazardous wastes must follow State hazardous waste regulations for proper management and disposal of hazardous wastes applicable to their generator category.

If the lighting wastes have not been tested to show that they are not hazardous, or if the generator doesn't have other supporting data, then the generator should assume the lamps are hazardous and manage them as hazardous waste. The generator may use data obtained from the manufacturer, other generators, or published studies to assist with their hazardous waste determination.

How should lighting wastes determined to be hazardous waste be managed?

Hazardous waste lamps can either be managed in full compliance with the Colorado Hazardous Waste Regulations [6 CCR 1007-3] Parts 260-268, 99 and 100, or they can be managed in compliance with the reduced requirements of the Universal Waste Rule in Part 273. The "Guide to Generator Requirements of the Colorado Hazardous Waste Regulations" describes the requirements applicable to each generator category if the generator decides to manage their lighting waste under the full requirements of Parts 260-268, 99 and 100. The guide is available on the Division website or by calling the Hazardous Materials and Waste Management Division.

The Universal Waste Rule provides an alternative set of reduced management standards that the generator can follow instead of the full hazardous waste requirements. This rule was designed to reduce the regulatory burden on non-residential entities that generate these wastes and to encourage recycling, while at the same time reducing the amount of hazardous waste items illegally sent to municipal solid waste landfills.

What are the disposal options for hazardous waste lamps?

A generator can send his/her hazardous waste lamps to a facility that legitimately recycles the waste or ensure delivery of their hazardous waste lamps to a permitted hazardous waste treatment, storage or disposal facility (TSDF). Municipal solid waste landfills in Colorado are not permitted to accept any quantity of non-residential hazardous waste for disposal.

What are Universal Wastes?

The Universal Waste Rule [*Colorado Hazardous Waste Regulations 6 CCR 1007-3 Part 273*] includes certain hazardous wastes that are commonly generated by very small to very large non-residential sources such as businesses, governmental agencies, and schools. Universal wastes are subject to wide spread use, which makes disposal of these hazardous wastes difficult to control.

Universal Wastes include many:

- batteries
- pesticides
- mercury-containing devices
- mercury-containing lighting wastes
- aerosol cans
- electronic devices and components

Materials included as universal wastes are regulated under the Resource Conservation and Recovery Act (RCRA) and have been required to be handled as hazardous wastes since the early 1980s. In the past, these wastes needed to be managed in full compliance with the hazardous waste regulations, including labeling, employee training, manifest requirements and restrictive time limits. Materials managed as universal wastes can be managed under these reduced requirements, but they are still hazardous wastes.

Why manage a waste as universal waste?

Managing wastes as universal wastes is most beneficial to small and large quantity generators of hazardous waste, or conditionally exempt small quantity generators that would otherwise be small quantity generators if they did not manage some of their wastes as universal wastes. The primary benefits of choosing the reduced management standards of the universal waste rule are that the waste does not count toward the monthly total of hazardous waste in determining generator category; the waste can be shipped without a hazardous waste manifest; the waste can be shipped by common carrier instead of a hazardous waste transporter; there are reduced notification and record-keeping requirements; and the storage time limits are less restrictive. Because

universal waste does not require a hazardous waste manifest for shipment in Colorado, it is not considered to be hazardous waste under US Department of Transportation (US DOT) regulations, though other regulations may apply. State requirements for universal waste transporters are included in 6 CCR 1007-3 Part 273 Subpart D.

What are the requirements for universal waste management?

Categories of Universal Waste Handlers

Under the Universal Waste Rule, persons who generate or accumulate waste batteries, pesticides, mercury-containing devices, aerosol cans containing hazardous wastes, mercury-containing lamps or electronic devices and components are considered to be “handlers” of universal waste. [6 CCR 1007-3 Section 273.9] [Note: this definition is different from that of a **generator** of hazardous waste].

There are two categories of handlers, Small Quantity Handlers of Universal Waste and Large Quantity Handlers of Universal Waste. A small quantity handler of universal waste is one who does not accumulate more than 5,000 kilograms of total universal at any one time (i.e., add together the amount of batteries, lamps, computers, etc. that you manage). A large quantity handler of universal waste is a handler of universal waste who accumulates 5,000 kilograms or more of total universal waste. [6 CCR 1007-3 Section 273.9] In either case, a handler cannot accumulate more than 35 kilograms (about 77 pounds) of elemental mercury at one time. The designation of small quantity or large quantity handler of universal waste has no relationship to a facility’s hazardous waste **generator** status. Thus a small quantity generator of hazardous waste may be a large quantity handler of universal waste, and vice versa.

If at any time during a calendar year, a facility exceeds the quantities for a small quantity handler of universal waste, they would become a large quantity handler until the next calendar year when they can re-evaluate their status. [6 CCR 1007-3 Section 273.9] In practice, many facilities in this situation choose to operate as a large quantity handler year round because it is easier for them to have one set of management standards for their employees to follow.

Labeling

When a universal waste lamp is generated, it must be labeled as either “Waste Lamp,” “Used Lamp” or “Universal Waste Lamp.” If the waste is placed into an accumulation container, only the accumulation container needs to be labeled, not the individual lamps within it. If a waste lamp is not in good condition and is showing

signs of breakage or damage, it must be individually over-packed in a closed packing container that is properly labeled and capable of preventing releases of hazardous constituents to the environment under reasonably foreseeable conditions. [6 CCR 1007-3 Sections 273.13, 273.33] If the accumulation container is not in good condition, the lamps must be removed and put into a container that is in good condition.

Accumulation of Waste

Universal waste handlers are required to manage their waste in a manner that prevents release of the waste or waste constituents. [6 CCR 1007-3 Sections 273.13, 273.33] There is a one-year accumulation time limit, and handlers must be able to demonstrate that universal wastes on-site have not been accumulated for more than one year. [6 CCR 1007-3 Sections 273.15, 273.35] Although it is not required to be marked with the accumulation start date, this would be one of the easiest ways to document that the waste is in compliance with the one-year accumulation limit.

Shipment of Waste

A universal waste handler cannot dispose of universal waste on site without a permit, and treatment by the handler is not allowed except under limited conditions (see the section on handler treatment). Universal waste can only be shipped to another universal waste handler, a destination facility or a foreign destination. Shipment to another universal waste handler is allowed to aid in consolidation of wastes. A destination facility is a facility that is permitted to treat, dispose or recycle the waste. [6 CCR 1007-3 Section 273.9]

Shipment of universal waste in Colorado does not require the use of the hazardous waste manifest system. Therefore, universal waste is not considered to be hazardous waste under US DOT regulations. The US DOT regulates some universal wastes as hazardous materials because they meet criteria for one or more hazard classes, but the word "waste" may not be used in the shipping name. [6 CCR 1007-3 Section 273.52]

Other states may have different requirements for wastes that are managed as universal waste in Colorado. The handler should always confirm the regulatory status of universal wastes in the destination state and in all intervening states the waste will travel through.

Notification

Small quantity handlers of universal waste are not required to notify the Division of their universal waste management activities. [6 CCR 1007-3 Section 273.12] Large quantity handlers of universal waste are required to notify the Division of their universal waste management activities and obtain an EPA identification

number using the Colorado notification form. [6 CCR 1007-3 Section 273.32] This must be done even if the facility has previously notified and received an EPA identification number for other hazardous waste activities. Their EPA identification number will remain the same.

Employee Training

Small quantity handlers of universal waste are required to inform all employees who manage universal waste about the proper handling and emergency procedures appropriate to the types of universal waste at the facility. [6 CCR 1007-3 Section 273.16]

Large quantity handlers of universal waste are required to ensure that personnel are thoroughly familiar with the requirements for universal waste management and emergency response relative to their level of responsibilities in dealing with the waste. [6 CCR 1007-3 Section 273.36]

Spills

All handlers of universal waste are required to immediately containerize and appropriately manage any spills or residues from releases of universal wastes. [6 CCR 1007-3 Sections 273.17(a), 273.37(a)] The handler must determine whether the broken lamp and any solid wastes generated while cleaning it up exhibit any characteristics of hazardous waste. If the wastes generated while cleaning up are hazardous, they should be managed in accordance with the hazardous waste regulations and not the universal waste requirements. The handler of the universal waste at the time of the release would be the generator of the newly generated waste and must adhere to all applicable requirements of the Colorado hazardous waste regulations. [6 CCR 1007-3 Sections 273.17(b), 273.37(b)] The handler can continue to manage the broken lamp as universal waste, but must over-packed the broken lamp in a closed packing container that is properly labeled and capable of preventing releases of hazardous constituents to the environment under reasonably foreseeable conditions.

Record Keeping Requirements

A small quantity handler of universal waste is not required to maintain records. [6 CCR 1007-3 Section 273.19] However, it is strongly advisable to keep adequate records to document waste management practices and substantiate the facility's universal waste handler status.

A large quantity handler of universal waste must keep written records for universal wastes shipped to and from its facilities. These records must be kept for at least three years and include: the types and quantities of universal waste shipped and/or received, the date the

waste was shipped or received, and to whom the waste was shipped. [6 CCR 1007-3 Section 273.39] There is no requirement to maintain formal training records for either category.

Transporters of universal waste are required to keep records in accordance with US DOT requirements. A destination facility is subject to all applicable requirements of 6 CCR 1007-3 Parts 264-268, 99 & 100. If the destination facility recycles the universal waste without storing it, they need only notify the Department of their activity under 6 CCR 1007-3 Part 99 and keep records of each shipment. If the destination facility is a Treatment Storage and Disposal Facility (TSDF), they are required to keep records in accordance with their hazardous waste permit.

Can a universal waste handler treat its hazardous wastes?

Crushing of universal waste lamps by handlers of waste mercury-containing lamps is allowed as long as it is conducted in accordance with the requirements of Part 273.13 or 273.33 of the Colorado Hazardous Waste Regulations. Prior to crushing waste lamps, a handler must develop and implement a written procedure detailing how to crush the lamps safely. Included in this document must be the type of equipment used, operation and maintenance of the equipment and the precautions that need to be taken to protect all workers. In addition, the document must include a review of the wastes that will be generated from the crushing activities and how they will be managed.

Handlers of universal wastes must ensure that the waste lamps are crushed in a completely enclosed system that is designed to prevent the release of any universal waste or component of universal waste to the environment (for example, a sealed tank or container that is equipped with, at minimum, a filter to capture mercury emissions). Special management procedures necessary to manage the waste properly also need to be evaluated prior to crushing. The handler must ensure that the area in which the universal waste lamps are crushed is well ventilated and monitored to ensure compliance with applicable regulatory exposure levels for mercury. Additionally, the written procedure must detail the frequency of filter change out. [Note: it may be necessary to file an Air Pollution Emission Notice (APEN) for the crushing operation and/or to use control devices to capture airborne contamination]. A spill kit must be readily available in case wastes are spilled during the crushing activities.

A small or large quantity handler of universal waste who crushes universal waste lamps must determine whether the crushed lamp, its residues and/or any other solid

wastes generated (e.g., filters) exhibit one or more characteristics of hazardous waste. If the crushed lamps exhibit a characteristic, they may continue to be managed as universal waste or they may be managed in compliance with 6 CCR 1007-3 Parts 260-268, 99 and 100. Wastes generated during the crushing process, exclusive of the crushed lamps themselves, may not be managed as universal wastes.

If the residues or other solid wastes generated during the crushing process exhibit one or more characteristics of hazardous waste, the handler is considered to be the generator of the newly generated hazardous waste and must comply with all applicable sections of 6 CCR 1007-3 260-268, 99 and 100. Used air filters from drum-top lamp crushing devices fit the definition of “sludge” as solid waste generated from an air pollution control facility. Since these filters are generally characteristic only for mercury and since characteristic-only sludges are excluded from the Colorado definition of solid waste if recycled, the used filters can go into the drum of crushed lamps as excluded solid waste when the drum is sent for recycling.

If the crushed universal waste lamp, its residues and/or any other solid wastes generated do not exhibit any characteristics of hazardous waste, the handler may dispose of them as solid wastes.

What about Conditionally Exempt Small Quantity Generators (CESQG)?

Conditionally exempt small quantity generators are those that generate less than 100 kilograms (approximately 25 gallons or 250 pounds) of total hazardous waste and no more than one kilogram of acutely hazardous waste per calendar month AND never accumulate more than 1000 kilograms of hazardous waste on site at one time. In Colorado, conditionally exempt generators must identify which of their wastes are hazardous wastes and must ensure that their wastes are sent to a facility that is permitted to accept it.

Conditionally exempt small quantity generators may choose to manage their mercury-containing lights as conditionally exempt wastes or as universal wastes. [6 CCR 1007-3 Section 273.8] Unlike small and large quantity generators of hazardous waste, conditionally exempt generators are not required to notify the State of their regulated waste activity or get an EPA identification number. There is no time limit on how long they may store their hazardous waste on site as long as they don't exceed the quantity limits for conditionally exempt small quantity generators, and they may transport their hazardous waste without a hazardous waste manifest under a standard bill of lading. Because of the reduced management requirements already

applicable to conditionally exempt small quantity generators of hazardous waste, it is generally not to their benefit to manage their wastes as universal waste unless they would otherwise be a small quantity generator.

Conditionally exempt generators may not dispose of their hazardous wastes on site or send them to a solid waste landfill in Colorado. These wastes must be sent to a permitted hazardous waste treatment, storage or disposal facility (TSDF), sent to a legitimate recycler of the waste or sent to an out-of-state disposal facility that is permitted to accept conditionally exempt small quantity generator hazardous wastes.

PCB-containing Light Ballasts

Ballasts are small metal box-shaped devices in fluorescent lamps that control the flow of electricity to the light tube. All fluorescent light ballasts manufactured through 1979 contain polychlorinated biphenyls (PCBs). Ballasts manufactured after 1979 that do not contain PCBs are labeled "No PCBs". If the ballast isn't labeled, the generator should assume it contains PCBs. PCBs are a hazard to human health and the environment due to their persistence in the environment, bioaccumulation in the food chain and toxicity.

PCB-containing light ballasts are regulated under the Toxic Substances Control Act (TSCA). Under these regulations, persons other than manufacturers of PCB ballasts may dispose of small, non-leaking ballasts containing less than 50 parts per million (ppm) PCBs as municipal solid waste with the prior approval of the solid waste landfill. However, the EPA and the State health department recommend that all PCB-containing ballasts be disposed of at a TSCA-approved incinerator, disposal facility or recycler in order to reduce potential long-term liability for the generator. As a practical matter, few solid waste landfills are willing to accept any PCB-containing materials for disposal.

If the ballast has been punctured or otherwise damaged, an oily, tar-like substance may be exposed. If this substance contains PCBs, the ballast and all materials it contacts are considered to be PCB wastes. Leaking PCB-containing ballasts and all ballasts containing 50 ppm or more PCBs must be sent to a TSCA incinerator, TSCA landfill or other EPA-approved destruction method in accordance with EPA regulations.

DEHP-containing Ballasts

Di (2-ethylhexyl) phthalate (DEHP) was used to replace PCBs in some ballasts manufactured from 1979 through 1991. Although DEHP is listed as a hazardous waste under the Resource Conservation Recovery Act as

an unused commercial chemical product, it is no longer considered to be hazardous waste once it has been used in a lighting ballast. Disposal of DEHP ballasts in a municipal landfill is not recommended because the DEHP is a liquid that is contained in a metal casing that could rupture, thus releasing the DEHP into the environment. The preferred method of disposal is incineration or a combination of metals recovery and incineration.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Persons who dispose of PCB wastes, mercury-containing lighting waste or DEHP-containing wastes must notify the National Response Center (800-424-8802) if they dispose of these wastes at greater than the reportable quantity (RQ) under CERCLA. The reportable quantity under CERCLA is one pound of PCBs, one pound of mercury or 100 pounds of DEHP in a 24-hour period. EPA estimates that small PCB-containing light ballasts contain about 0.1 lbs of pure PCBs, so anyone disposing of ten or more light ballasts may be subject to CERCLA reporting requirements. EPA estimates that it would take about 11,000 four-foot T12 fluorescent lamps to equal one pound of mercury and about 1600 fluorescent light ballasts to have 100 lbs of DEHP.

Persons who dispose of any quantity of these wastes in a municipal solid waste, hazardous waste or TSCA-approved landfill are not absolved from liability under CERCLA. Failure to report is a violation of CERCLA Section 103.

For more information:

**Colorado Department of
Public Health & Environment**

**Hazardous Materials and
Waste Management Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530**

**Customer Technical Assistance (303) 692-3320
(888) 569-1831 ext. 3320 toll-free**

Website www.colorado.gov/cdphe/hm
E-mail comments.hmwmd@state.co.us

CHW-003

This Compliance Bulletin is intended to provide guidance on the appropriate management of wastes based on Colorado solid and hazardous waste statutes and regulations only. The wastes described in this guidance may also be regulated under other statutes and regulations.