

Lamp Disposal Regulations Deserve Careful Consideration

All fluorescent, compact fluorescent and high-intensity discharge (HID) lamps [light bulbs], including mercury vapor, high-pressure sodium (HPS) and metal halide (MH) lamps [probe-start, pulse-start and ceramic MH], most induction [electrode-less discharge] lamps, many cold-cathode lamps, and even some neon lamps, contain mercury in widely varying amounts. Based on the serious toxicity of that heavy metal element, when such lamps become waste, their handling and disposal are subject to both federal and state regulations. The principal federal statute is the Resource Conservation and Recovery Act (**RCRA**). More than a decade ago, as part of the continuing effort to reduce the quantity of hazardous waste materials entering the municipal waste stream at incinerators and at landfills, the U.S. Environmental Protection Agency (EPA) issued its “Universal Waste” rule, under RCRA, streamlining the existing requirements for collecting and transporting certain widely dispersed hazardous wastes. Initially, the Universal Waste rule only contained provisions for pesticides, batteries, and mercury-containing thermostats; however, effective on January 6, 2000, the EPA added hazardous waste lamps, including those containing mercury, to the items that are covered by this rule.

The Universal Waste rule applies to lamps that exhibit at least one characteristic of hazardous waste, such as toxicity. Lamps having low mercury content [reduced toxicity] can simply be placed into the non-hazardous waste stream. Lamps with higher mercury content, those above a specific level [lamps that do not pass RCRA’s Toxicity Characteristic Leaching Procedure (**TCLP**) test], are eligible to be managed under these streamlined universal waste requirements, provided that they are delivered [or shipped via a common carrier] intact (unbroken) to an approved destination facility that properly disposes of or recycles the lamps. However, if this universal waste lamp handling process is not strictly adhered to, then lamps with higher mercury content must be treated as a fully regulated “hazardous waste”. Those more toxic lamps must be handled [accumulated and stored] in accordance with RCRA hazardous waste management regulations, and they must be shipped using a complicated and costly “Hazardous Waste Manifest” for transportation directly to a fully permitted hazardous waste treatment, storage or disposal facility. Although low mercury lamps that are “TCLP-compliant” can be included in (mixed with) the disposal of other non-hazardous municipal waste, waste haulers and waste handling facilities are becoming increasingly hesitant to accept truckloads that include mercury-containing lamps, regardless of whether those lamps would pass the TCLP test. Placing lamps that are not low mercury into a dumpster, along with other non-hazardous wastes, could result in the rejection of the entire load of waste at an incinerator or at a landfill [with the probable return of that load of waste to the originating site]. Nor should, in most states, any spent lamps be intentionally crushed, which releases the toxic materials (mercury, lead and possibly additional toxic substances) directly into the environment. Such an action could result in serious fines and other penalties from state and/or federal authorities. The Property Owner [the lamp waste “Generator”] has the primary responsibility [both financial and legal liability] for ensuring that proper disposal of mercury-containing lamps does take place. In addition, another entity (such as a Maintenance Contractor) that removes lamps from service, stores them for an extended period, or who does not dispose of them properly, can also be held jointly responsible [as the “Co-Generator” of the lamp waste]. Think about whether you really want to risk being judged liable for a portion of a “Superfund Site” (a major toxic waste dumpsite), with the potential for years of on-going cleanup expenses and associated litigation costs.

The federal EPA rules covering lamp disposal do provide for two exemptions. The first exemption is for residential properties, which can dispose of very small quantities of lamps with their everyday municipal trash. The second exemption, albeit only partial, is for “Conditionally-Exempt Small Quantity [waste] Generators” (**CESQG’s**), which are entities that generate not more than 100 kg [220 pounds] of hazardous wastes per calendar month, including any mercury-containing lamps. CESQG’s must still dispose of their hazardous wastes at an approved facility. These wastes cannot include any other regulated highly toxic substances such as PCB-containing lighting ballasts or building materials that contain asbestos. All other “Generators” of more significant quantities of hazardous wastes (including mercury-containing lamps) such as commercial, industrial, institutional (education, healthcare, municipal and religious) sites, plus multiple-dwelling unit (MDU) residential facilities are required to comply with the “Universal Waste” lamp rule. Alternatively, they can choose to manage their hazardous waste lamps as fully regulated hazardous waste; however, this option is both time consuming and costly. Consequently, it is in the best interest of virtually every site to recycle all of their spent lamps by sending them directly to a qualified [EPA-licensed] lamp disposal firm.

Some states have requirements that are more stringent than, or are in addition to, the federal Universal Waste rule. For example, the Commonwealth of Pennsylvania has regulations that prohibit the disposal of “CESQG”

hazardous wastes in non-hazardous waste landfills located in Pennsylvania. In addition, there are no commercial hazardous waste disposal facilities located within PA; however, there are DEP-permitted lamp recycling firms located in PA. Due to the higher cost for the alternative [hazardous waste disposal out of state]; this effectively results in almost all mercury-containing spent lamps generated in Pennsylvania being recycled (with the exception of lamps generated by household residences). This means that in PA, nearly all non-TCLP compliant (higher mercury content) lamps must be managed properly, every time they are removed from service. For more PA-specific information concerning mercury-containing lamps, search for the keyword “mercury” at the PA DEP’s website: <http://www.dep.state.pa.us/> . If the lamp waste generating site is not located within Pennsylvania, consult that particular state’s environmental protection agency website for their specific disposal requirements, which can vary quite significantly [as can the compliance enforcement procedures and the penalties for violating the rules], even in nearby or adjacent states.

The cost of recycling can range from 15 to 25 cents per foot of lamp for linear (straight) fluorescent lamps, \$0.50 to \$1.00 per lamp for compact fluorescent (CF) lamps [depending upon whether the CF lamp includes an integral (internal) ballast], and \$1.00 to \$2.00 each for HID lamps [due in part, to their sometimes much higher mercury content, plus their added complexity and unique components]. You also can request from the lamp recycling company, and you should expect to receive, a “Certificate of Destruction”, [formal documentation that lamp disposal has in fact been accomplished properly]. Upon request, some recyclers can publish this certificate on the “world-wide web”, thus assuring its ready availability, should the need to prove compliance ever arise. For more information, visit the lamp-recycling industry website: <http://www.lamprecycle.org/> , or alternatively, the Association of Lamp and Mercury Recyclers (ALMR), at their website: <http://www.almr.org/> .

There is actually light at the end of this dark tunnel, and no, it does not emanate from an oncoming train. Today, all three of the major lamp companies offer a broad range of fluorescent lamps, some types of CF lamps, and a few types of HID lamps (so far) that pass the TCLP test, at minimal or no added price premium. Some manufacturers of HPS (high-pressure sodium) lamps bundle low toxicity with other premium attributes, such as longer rated lamp life and/or non-cycling lamp failure mode (occurring at the lamp’s “end-of-life”); thereby justifiably commanding a moderately higher price. One major maker of lamps offers a family of very low mercury (TCLP-compliant) and lead-free HPS lamps. Another major lamp manufacturer has recently introduced a “second-generation” line of linear fluorescent lamps, which offers an even lower level of mercury content, than that which is required to pass the TCLP test, and that is also longer-lived and has higher lumen maintenance [higher sustained light output over the extended life of the lamp]. However, to date, no major lamp manufacturer has been able to produce a fully functional fluorescent, CF or MH (metal halide) lamp that is completely free of mercury. It is probable that at least one of the large, multi-national lamp makers is working toward that very challenging goal. Market demand for compliance with international environmental regulatory requirements for low toxicity materials and components, such as the “RoHS” [Restriction of Hazardous Substances] Standard, adopted by the European Union, has increased the urgency of that effort.

All recently produced mercury-containing lamps carry an easily recognizable “Hg” mark [the chemical symbol for the element mercury], both on the lamp itself, and on its packaging. Many linear fluorescent lamps that are low toxicity (low mercury and lead-free) have either green tinted metal end caps and/or green colored text on the lamp’s glass outer surface [see the table listed below for the specific product brand names]. On some low toxicity HID lamps, there is a green band on the tip of the glass envelope of the lamp. Notwithstanding this, it would be more prudent (and more environmentally responsible) to simply recycle all mercury-containing lamps, regardless of their toxic material content. The cost to do so is reasonable [only about 1% of the total life cycle cost of the lighting, including energy, material (the lamp) and labor], compared to the cost of the more difficult disposal alternatives. Furthermore, it is clearly the right thing to do for our future environment.

Consider that our clients, their customers and especially future generations of lighting consumers depend upon us to assist them in moving toward a brighter, healthier and more toxic-free environment.

<u>Lamp Manufacturer</u>	<u>Low-Toxicity Trade Name</u>
General Electric Lighting	ECOLUX
Philips Lighting	ALTO, ALTO II
Osram SYLVANIA	ECOLOGIC

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