



Linda S. Adams
Secretary for
Environmental Protection

Q&A: UWEDs AND UWED DISMANTLING



Maureen F. Gorsen,
Director Department of
Toxic Substances
Control

DTSC has prepared this Question and Answer (Q&A) document to assist electronic waste recyclers in understanding the various types of residuals, including hazardous wastes, which may be generated from the dismantling of Universal Waste Electronic Devices (UWEDs). This document is not intended to be a comprehensive reference and is not meant to supersede the regulations and requirements governing the management of electronic wastes and their treatment residuals. For complete information on how to manage electronic wastes, please refer to California Code of Regulations, Title 22, Chapter 23.

Question 1: Are all devices that use or transfer electrical power Universal Waste Electronic Devices (UWEDs)?

Answer 1: No. Electronic equipment/devices contain **circuitry**, such as printed circuit boards, that provide a variety of functions not found in simpler electrical equipment/devices. Electrical equipment/devices can usually be switched on or off, but generally *cannot* perform other functions.

Programmable devices contain electronic circuitry and are therefore UWEDs, whereas **non-programmable devices** would generally be considered electrical equipment. For example, programmable toasters or coffee makers would be considered *UWEDs*, but non-programmable toasters or coffee makers would be considered *electrical equipment*.

Q2: Can you provide some examples of UWEDs vs. non-UWEDs?

A2: Examples of UWEDs include: computers, computer peripherals, telephones, answering machines, radios, stereo equipment, tape players/recorders, phonographs, video cassette players/recorders, compact disc players/recorders, calculators, and some appliances.

Examples of wastes that DTSC does not consider to be UWEDs include: oil-filled transformers, metal switch gear, electrical power distribution and transmission equipment, large metal microwave ovens, and other items that are not predominantly plastic, and/or hazardous for toxicity.

Q3: How do I manage the components of UWEDs that I dismantle onsite?

A3: Components of UWEDs, such as printed circuit boards, that are removed via disassembly or shredding are hazardous waste **treatment residuals**. As a condition of their authorization, UWED handlers who disassemble or shred must: 1) contain the treatment residuals, 2) perform hazardous waste determinations for the residuals, and, if they are hazardous, 3) must properly manage them as hazardous wastes (an exception is *circuit boards*, which can be toxic for metals but may be managed as exempt scrap metal if they are recycled for their metal content; see item 6 below).

Q4: How do I classify and manage a waste microwave oven?

A4: As mentioned in A2 above, some appliances are UWEDs, but not all.

Public Resources Code section 42166 lists microwave ovens as **major appliances** under the Metallic Discards Act. If the microwave oven contains “materials that require special handling” (**MRS**H), such as capacitors with PCBs (Polychlorinated Biphenyls), DEHP (Diethylhexylphthalate) or metal-encased capacitors, only a certified appliance recycler (**CAR**) may dismantle it and remove the MRS

H. Microwave ovens that are **primarily metal** may be collected by universal waste handlers/recyclers, but if they contain MRS

H, they may only be dismantled by a CAR. Microwave ovens that are **primarily plastic** are not subject to the Metallic Discards Act major appliance requirements, but are subject to UWED management requirements. These predominantly plastic microwaves may be dismantled by a UWED recycler pursuant to the UWED requirements *regardless* of whether they contain MRS

H or not.

Q5: How do I manage a waste toaster oven?

A5: The analysis that applies to microwaves also applies to toaster ovens. Toaster ovens that are hazardous, but are exempt scrap metal would not be UWEDs; those that are hazardous (due to toxicity) but are not exempt scrap metal may be classified as UWEDs.

Q6: May I heat printed circuit boards in order to remove chips or other components from the boards?

A6: It depends on where the circuit boards are generated. Remember that DTSC regulates both wastes **and** activities, and that wastes managed under various circumstances may be regulated differently.

Circuit boards removed from UWEDs **onsite** would be considered UWED treatment **residuals**, and therefore subject to the management requirements for UWEDs. Heat treatment of UWED residuals is not allowed under universal waste regulations. A handler wishing to still conduct this activity would need a hazardous waste facility permit or other form of authorization from DTSC.

Circuit boards **already removed** from electronic devices **prior** to receipt, or never installed in an electronic device, are considered **scrap metal** and are **not** subject to the management requirements for UWEDs. No permit would be needed to heat circuit boards received as such from **offsite**. However, the handler must be able to prove that some fraction of the material was recycled to *recover metal values*, in order to fulfill the scrap metal exemption.

Q7: How do I classify and manage Cold Cathode Fluorescent Lamps (CCFLs) removed from UWEDs such as fax machines and digital scanners?

A7: CCFLs would qualify as **treatment residuals** once they are removed. While CCFLs meet the definition of a hazardous waste due to their concentration of **mercury**, they also meet the definition of a **universal waste lamp** and can be managed as such. See Title 22, California Code of Regulations, §66273.33(c).

Q8: How do I classify spent printer toner cartridges removed from UWEDs?

A8: Used printer toner cartridges are commonly found in UWEDs. Toner cartridges can be removed from UWEDs in accordance with the universal waste regulations. Once removed, they are considered **treatment residuals**. They may be classified as **exempt empty containers** if they are empty. As empty containers, the toner cartridges may be sent for disposal or refill. Toner cartridges that are not empty may be hazardous wastes and, if so, must be managed accordingly.

Q9: How do I classify and manage coolant removed from projection TVs?

A9: DTSC is aware of two coolants commonly used in projection TVs: mineral oil and glycol solutions. Once removed, these **treatment residuals** must be properly classified as discussed in item A3 above. Generally speaking, mineral oil will be **used oil** and would be regulated as a non-RCRA hazardous waste, whereas the glycol solutions should be evaluated to determine if they are hazardous wastes (due to toxicity).

Q10: How do I distinguish between capacitors that contain PCBs and those that don't?

A10: Many UWEDs contain capacitors that must be removed before the devices can be further processed. A capacitor containing PCBs will have a marking on the back indicating such. PCBs were banned in products after 1978, but existing stocks were allowed to be sold, so products through 1980 should be assumed to contain PCBs (unless marked as not containing PCBs). You should train your employees to look for

these markings and **segregate** capacitors that have PCBs. If there are no markings on the back of the capacitor, set it aside for a hazardous waste determination, or assume that they contain PCBs in order to avoid misclassifying a hazardous waste as non-hazardous.

Q11: I've heard that certain rechargeable batteries are highly flammable. How should I instruct my employees to properly handle them while dismantling UWEDs?

A11: Different types of common batteries, especially lithium "button" batteries, can be highly flammable and dangerous if the contacts touch one another. It is recommended that the button batteries be individually placed on tape to keep them separate from each other.

Some non-automotive batteries removed from UWEDs may also contain acid. If employees will be removing many different types of batteries and commingling them, they should take the precaution of bagging like batteries and separating them from other types to prevent a potentially hazardous situation.

Comments or Questions:

If you have questions about the material presented in this document, contact DTSC's Electronic Waste Team Coordinator, Rita Hypnarowski, at (916) 255-3699 or rhypnaro@dtsc.ca.gov.