Division of Environmental Response and Revitalization
July 2023

Ohio Environmental Protection Agency

Recycling of Cathode Ray Tubes (CRTs)

THIS POLICY DOES NOT HAVE THE FORCE OF LAW **Hazardous Waste Program**

*CRTs are the video display components of televisions and computer monitors. **CRTs** have a different exclusion from the definition of waste than the one for **electronic equipment**. Therefore, there are two different guidance documents for these related items. In a CRT, funnel glass and the frit that binds the front panel glass to the funnel glass typically contains enough lead to require managing it as hazardous waste under certain circumstances. The change in the CRT rules is an attempt to manage the waste in a way that will promote additional safe recycling and reuse of CRTs.*

Overview

The rules provide several conditional exclusions from the hazardous waste management standards for CRTs and CRT glass destined for recycling. These safe standards aim to increase the collection and recycling of CRTs, and to reduce the amount of lead in landfills by allowing the lead to be reused to make new CRT glass or sent to lead smelters. Under these regulations, used, unbroken CRTs are not regulated as hazardous waste unless they are stored for more than a year. The rules establish more manageable standards for unbroken CRTs because the risk of lead releases from them is very low. Since the risk is so low, the storage limitation on unbroken CRTs applies only to collectors or recyclers.

Recycling of Cathode Ray Tubes (CRTs)?

CRTs generated by Households

- There is an exclusion from the hazardous waste rules for CRTS that come from household. These CRTs are not subject to the hazardous waste rules if they are kept separate from regulated CRTs.

CRT Generated by Businesses

- Used intact CRTs destined for recycling from businesses are conditionally excluded from the definition of waste as long as they are not speculatively accumulated defined in OAC rule 3745-51-01 by the collector or the processor.
- Used intact and/or broken CRTs destined for disposal, are subject to regulation as a hazardous waste due to the likelihood that it will exhibit the toxicity characteristic for lead. A generator has the option to sample and analyzed representative samples of the different types of glass to demonstrate that the glass is not hazardous waste.
- Used broken CRTs and processed CRT glass undergoing recycling are excluded from the definition of waste if they are managed in accordance with OAC rule 3745-51-39 as outlined below.

Used broken CRTs are not wastes if they meet the following conditions:

- Stored in a building (with a roof, floor and walls) or placed in a container that is constructed, filled, and closed to minimize releases to the environment of CRT glass.
- Each container labeled or marked clearly with one of the following phrases: “Used cathode ray tube(s) – contains leaded glass” or “Leaded glass from televisions or computers.” It must also be labeled “Do not mix with other glass materials.”
- Must be transported in a container meeting the above requirements.
- Not accumulated speculatively defined in OAC rule 3745-51-01.

- If the glass is used as an ingredient in a product that is placed on the land or used as a substitute for a product which will be used on the land, you must comply with the applicable requirements of OAC rules 3745-266-20 to 3745-266-23 instead of the requirements of this rule.

Used, broken CRTs undergoing "CRT processing" are not wastes if they meet the following requirements:

- The waste is not speculatively accumulated as defined in OAC rule 3745-51-01.
- All processing activities must be performed within a building with a roof, floor, and walls.
- No activities may be performed that use temperatures high enough to volatilize lead from CRTs.

NOTE: The rules for speculative accumulation come into play at two points in the processing of the CRT glass.

- The first time is during the storage of broken or unbroken CRT before the funnel glass and the tube glass are separated.
- The second time for the clock to begin on speculative accumulation is after the tube glass has been separated, sized and stored (processed) prior to further recycling.

Processed glass from used CRTs destined for recycling at a CRT glass manufacturer or lead smelter after processing is not a waste unless it is accumulated speculatively. In addition, Processed CRT glass that are used as an ingredient to make a product without being reclaimed are excluded unless they are used in products that are placed on the ground in a manner constituting disposal or are accumulated speculatively. If the glass from used CRTs is used on the land or used to make products that are used on the land you must comply with the requirements of OAC rules 3745-266-20 to 3745-266-23. This may require the person who is making the product to obtain a hazardous waste storage permit and to demonstrate that the lead in the product has undergone a chemical reaction in the course of producing the products so as to become inseparable by physical means and meets the requirements for land disposal. The person who is shipping the processed glass for use in a product placed on the land must manage the glass destined for such use in accordance with the hazardous waste generator rules found in OAC chapter 3745-52.

Based on USEPA guidance CRT glass that is recycled in the following is also excluded:

- Used as a fluxing agent in copper smelting
- Used as a substitute for lead oxide in ceramic tiles

The rules also regulate the export of CRTs for recycling and reuse. The importation and exportation of CRTs is administered by U.S. EPA. These rules are found in OAC rules 3745-51-40 and 3745-51-41. Exporters shipping broken or unbroken CRTs to another country for recycling must notify EPA and receive written consent from the receiving country through EPA before shipments can be made. This requirement is similar to those applicable to exporters of hazardous waste, which are found at 40 CFR Part 262. Exporters shipping used, unbroken CRTs for reuse as computers to another country must submit a one-time notification to EPA.

Summary

Used, broken CRTs are not regulated as hazardous waste if the following conditions are met:

- CRT containers are clearly labeled regarding contents;
- CRTs are safely transported in containers designed to minimize releases;
- CRTs are stored in a building or container designed to minimize releases; and
- CRTs are stored on site less than one year before recycling.

To remain unregulated, CRTs undergoing glass processing must follow the same requirements, except they must be processed inside a building, at temperatures not high enough to volatilize lead from the glass. CRT glass that has been processed and sent to a CRT glass manufacturer or a lead smelter also is unregulated unless it is stored for more than one year (see definition for speculative accumulation) or used in a manner constituting disposal (applied to the land).

Title

CRT glass going to any other kind of recycler may be eligible for exemption under existing regulations. Also see US. EPA letter about recycling CRTs (14839).

Contact

For more information, contact the Hazardous Waste Compliance Assurance Section of the ***Division of Environmental Response and Revitalization*** at 614-644-2924, or the District Office.

Definition

A material is "accumulated speculatively" if it is accumulated before being recycled. A material is not accumulated speculatively if the person accumulating the material can show that the material is potentially recyclable and has a feasible means of being recycled; and that during the calendar year, commencing January first, the amount of material that is recycled, or transferred to a different site for recycling, equals at least seventy-five per cent by weight or volume of the amount of that material accumulated at the beginning of the calendar year. In calculating the percentage of turnover, the seventy-five per cent requirement is to be applied to materials of the same type (e.g., slags from a single smelting process) that is recycled in the same way (i.e., from which the same material is recovered or that is used in the same way). Materials accumulated in units that would be exempt from regulation under paragraph (C) of rule 3745-51-04 of the Administrative Code shall not be included in the calculation. (Materials that are already defined as "wastes" also shall not be included in making the calculation.) Materials are no longer in this category once they are removed from accumulation for recycling.