Department of Toxic Substances Control

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Fact Sheet

The mission of DTSC is to protect California's people and environment from harmful effects of toxic substances by restoring contaminated resources, enforcing hazardous waste laws, reducing hazardous waste generation, and encouraging the manufacture of chemically safer products.

Final Disposition Options for Universal Waste: Cathode Ray Tubes and CRT Glass

This fact sheet provides helpful information on the changes between the emergency regulation and the final regulation regarding waste management of cathode ray tubes. The information here is not a substitute for complying with regulations as required. For specific, detailed requirements, consult the California Code of Regulations.

Regulatory Summary

Cathode ray tube (CRT) devices are "covered electronic devices"[1] under California's Electronic Waste Recycling Act of 2003 (EWRA). CRT devices, bare CRTs[2], and CRT glass[3] (residuals from the treatment of CRTs) are hazardous wastes that are managed under the universal waste management standards[4] pursuant to EWRA. Due to technological advances and decreased demand for the manufacturing of new CRT devices, the recycling pathways allowed under the Department of Toxic Substances Control's (DTSC's) universal waste regulations to manage waste CRTs became inadequate.

In 2012, the emergency regulation "Disposition Options for Universal Waste CRTs and CRT Glass" was adopted to address the changing technology demands and handling of these devices. The emergency regulation was readopted in 2014 and 2016. DTSC proposed to finalize the successful provisions of the emergency regulation, beginning with a public notice on July 6, 2018. The final regulations became effective on Monday, October 22, 2018.

Finalization of the emergency regulations ensures a path for the continued safe and effective management of waste CRTs and CRT glass – reuse, recycling, and proper and legal disposal. In the final regulation, DTSC has kept most of the emergency regulation provisions that were found to be effective, made changes to some of the provisions for clarity and efficiency, and retired some options that were not successfully implemented. The following outlines a summary of key changes.

[1] See Classification of an Electronic Device as a Covered Electronic Device in the California Code of Regulations, title 22, division 4.5, chapter 10, section 66260.201
[2] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.6(a)(2)
[3] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.7(a)(2)
[4] California Code of Regulations, title 22, division 4.5, chapter 23

What Is Included in the Final Regulation

- **The option for universal waste handlers who accept waste CRT devices and CRTs as universal waste to dispose of the CRTs and CRT glass treatment residuals**
  The universal waste handlers who choose this option become the generators of hazardous waste and can no longer manage the CRTs and CRT glass treatment residuals under universal waste standards. These handlers are required to provide notifications and maintain documentation when disposing of CRTs and CRT glass in a permitted hazardous waste disposal facility.
- **The option for the disposal of CRT panel glass that meets specified conditions to be disposed of in a "CRT panel glass approved landfill"[5]**
  The universal waste handlers who choose this option may send CRT panel glass that meets waste testing criteria for disposal in a CRT panel glass approved landfill. See Option III below for details.
- **The requirement for the universal waste handler to make contractual arrangements with the intermediate facility**
  This requirement is to ensure that the CRTs or CRT glass is sent to the intended facility for its intended reclamation at a CRT glass manufacturer or a primary/secondary lead smelter.
- **The exclusion of CRT panel glass, which exceeds Total Threshold Limit Concentration (TTLC) only for barium when tested, from California's hazardous waste regulations[6]**
  CRT panel glass that meets the TTLC criteria only for barium and is recycled may be used for specific end uses.[7] For more details, see the following web page.

What Is *Not* Included in the Final Regulation

- **Recycling by means other than CRT glass manufacturing and lead smelting using the Excluded Recyclable Material (ERM) provision**

  This option for recycling was placed in the 2012 emergency regulation to allow handlers to find alternative recycling methods by using the ERM provision in Health and Safety Code section 25143.2. DTSC found that although some recyclers considered alternative recycling options, none were implemented by any recyclers throughout the time that the emergency regulation was in effect. Thus, this provision was not included in the final regulation.

- **Article 9: Recycling concurrence process for CRTs and CRT glass**

  This provision was added in conjunction with the use of the ERM provision and detailed a way for DTSC to monitor whether additional methods, aside from CRT glass manufacturing and primary/secondary lead smelting, are used for managing waste CRTs and CRT glass. As described above, DTSC concluded that the ERM provision was not implemented by any recyclers throughout the time that the emergency regulation was in effect, and the provision was therefore not included in the final regulation.

- **Article 10: The trade secrecy provision**

[5] See the definition of CRT Panel Glass Approved Landfill in the California Code of Regulations, title 22, section 66273.9
[6] Assembly Bill (AB) 1419 (Eggman, Chapter 445, Stats. 2016) amended Chapter 6.5 of Health and Safety Code by adding section 25143.2.5 to allow for the recycling of hazardous waste CRT panel glass, by exempting the material from DTSC's hazardous waste regulations if certain conditions are met and it exceeds the TTLC only for barium.
[7] See California Health and Safety Code, section 24143.2.5(d) for details.

This provision was also added in conjunction with the ERM provision and detailed the requirements for seeking to invoke trade secret protection for information submitted to DTSC. The trade secrecy provision detailed administrative processes that DTSC would follow to evaluate the request for such protection. Because the ERM concurrence process is not included in the final regulation, this provision was also not included in the final regulation.

Final Disposition Options for Waste CRTs and CRT Glass

Once waste CRT devices and CRTs are collected by universal waste handlers, they have the following options for management of the CRTs and CRT glass.

Option I: Recycle CRTs and CRT Glass

Universal waste handlers may send CRTs and CRT glass for recycling through CRT glass manufacturing or primary/secondary lead smelting.

- The universal waste handlers must maintain specific information on site regarding transporters, CRT glass manufacturer or lead smelters, and the dates and quantities of shipments to them, to ensure that CRTs and CRT glass reach their intended destination.
- The following specific information must be maintained on site pursuant to California Code of Regulations, title 22, section 66273.72(b)(3)(D), 66273.72(c)(3)(D), and 66273.75(f)(5):
    i) The name, address, and telephone number of the transporter;
    ii) The name and address of the CRT glass manufacturer or primary or secondary lead smelter;
    iii) The name, address, and telephone number of the intermediate facilities (if applicable) and a description of the facilities' activities;
    iv) Any copies of contractual arrangements made;
    v) The quantity of CRTs and the departure date of each shipment to any intermediate facility; and
    vi) Confirmation receipts from the CRT glass manufacturer or primary or secondary lead smelter indicating that CRT glass shipments were received no later than 90 days after the departure date to the intermediate facility.

Option II: Send CRTs and CRT Glass to an Intermediate Facility

Universal waste handlers may send CRTs or CRT glass to an intermediate facility (e.g., out-of-state recycler) for further processing prior to subsequent CRT glass manufacturing or lead smelting.

- The universal waste handler must make contractual arrangements with the intermediate facility to ensure that CRTs or the CRT glass is sent to the CRT glass manufacturer or primary or secondary lead smelter identified by the universal waste handler.
- The universal waste handler must maintain specific information on site (described above in Option I) pursuant to California Code of Regulations, title 22, section 66273.72(b)(3)(D), 66273.72(c)(3)(D), and 66273.75(f)(5).

Option III: Dispose of Tested CRT Panel Glass in Specific Landfills

Universal waste handlers who treat CRTs by separating the CRT panel glass from the CRT funnel glass may dispose of the CRT panel glass in a CRT panel glass approved landfill if the requirements outlined in California

Code of Regulations, title 22, section 66273.75(a)(9), section 66273.75(f)(2), and Article 8, Requirements for the Disposal of CRT Panel Glass, are met.

- The universal waste handler must ensure that there is no comingling of CRT funnel glass and CRT panel glass to avoid contamination of the panel glass with the hazardous constituents of the funnel glass.[8]
- It is the responsibility of the universal waste handler to determine that the CRT panel glass meets the following criteria:[9]
    i) Does not exhibit a Resource Conservation and Recovery Act (RCRA) hazardous waste characteristic of toxicity;
    ii) Does not exhibit the hazardous waste characteristic of toxicity by exceeding the Soluble Threshold Limit Concentration (STLC);[10]
    iii) Is a hazardous waste solely because it exhibits the characteristic of hazardous waste for toxicity only by exceeding TTLC thresholds;[11]
    iv) Does not exceed TTLC for 30,000 mg/kg for lead; and
    v) Meets land disposal restriction treatment standards as described in section 66273.81(a)(5).
- The universal waste handler who claims that the CRT panel glass it is handling meets the criteria outlined above must demonstrate that the CRT panel glass meets the criteria by maintaining the following records:[12]
    i) Description of the treatment method used to generate the CRT panel glass;
    ii) Documentation of the analysis (or analyses) and sampling method (or methods) used to identify and quantify all hazardous constituents;[13] and
    iii) Frequency with which the procedures will be reviewed or repeated to ensure analysis (or analyses) and sampling method (or methods) are accurate and up-to-date.
- For CRT panel glass that meets the testing criteria outlined in section 66273.81(b) and is destined for disposal at a CRT panel glass approved landfill, the universal waste handler must manage the CRT panel glass as described below:[14]
    i) Manage the CRT panel glass in a way that prevents releases of CRT glass to the environment by placing the CRT panel glass in a container or package that is structurally sound and able to prevent release to the environment, and immediately clean up and place in a container any CRT glass that is released or spilled;[15]
    ii) Clearly mark or label accumulation area/container “Excluded Hazardous Waste – CRT Panel Glass”;
    iii) Cannot accumulate CRT panel glass for longer than 180 days from the start of generation;

[8] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.75(f)(2)(A)
[9] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.81(a)
[10] See California Code of Regulations, title 22, division 4.5, chapter 10, section 66260.10 and chapter 11, section 66261.24
[11] See California Code of Regulations, title 22, division 4.5, chapter 10, section 66260.10 and chapter 11, section 66261.24
[12] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.81(c)
[13] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.81(b)
[14] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.82
[15] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.33.5(c)(1)(B)

iv) Provide personnel training to persons managing CRT panel glass for disposal as described in section 66273.36;
v) Respond to releases as required by section 66273.37;
vi) Submit a notification and certification signed by an authorized representative of the handler's facility[16] to DTSC at least 60 days prior to the initial shipment of CRT panel glass to a CRT panel glass approved landfill. The notification requirements must meet the requirements of section 66273.74(f) and must include the following:[17]
   - Name, address, and telephone number of CRT panel glass approved landfill receiving the CRT panel glass shipments;
   - Description of the CRT panel glass and how it was generated; and
   - The Identification (ID) number for the universal waste handler facility where the CRT panel glass was generated.
vii) If any hazardous constituent concentration changes in the CRTs or the treatment method generating the CRT panel glass that would alter the certification required by section 66273.82(g)(2) to make the certification invalid, the universal waste handler must update the notification and certification and submit them to DTSC at least 60 days prior to any subsequent shipment of CRT panel glass;
viii) For at least three years from the date of departure, keep records (for example, log, invoice, manifest, bill of lading, or other shipping document) of each shipment of CRT panel glass sent to a CRT panel glass approved landfill. The record must contain the information as outlined in section 66273.83(a); and
ix) Provide at least two copies of the notification and certification described in section 66273.82(g) to the transporter prior to each shipment of CRT panel glass being transported off site.

- Ensure that a copy of the notification and certification is kept by the landfill operator and that a copy of notification and certification is signed by the landfill operator and returned to the universal waste handler, as outlined in section 66273.84.

If the CRT panel glass does not meet the testing criteria in section 66273.81, the universal waste handler may use Option I, Option II, or Option V from this list.

Option IV: Recycle Certain Tested CRT Panel Glass That Is No Longer a Waste

If CRT panel glass exceeds TTLC for barium *only*, then the CRT panel glass is no longer a waste if it is recycled. CRT panel glass that meets the criteria and is recycled may be used for specific end uses: [18] For more information regarding the specifics of this option, please see our web page.

Option V: Dispose of CRTs at a Permitted Hazardous Waste Disposal Facility

Universal waste handlers may accept waste CRT devices and CRTs. Upon the decision by the universal waste handler to dispose of the wastes, the universal waste handler becomes the generator of hazardous waste and must manage the CRTs and CRT glass as hazardous wastes, including the following:

[16] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.82(g)(2)
[17] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.82(g)
[18] See California Health and Safety Code, section 25143.2.5 for details.

- Be deemed the generator of hazardous waste CRTs;
- Follow requirements per chapters 12-16, 18, 20, and 22 of division 4.5, title 22 of the California Code of Regulations
- Provide DTSC with a written notification containing the ID number of the universal waste handler facility where waste was generated and a description of the treatment method(s) used to generate the CRTs and CRT glass.[19]

For more information regarding hazardous waste generator requirements, please refer to the following fact sheet: https://www.dtsc.ca.gov/HazardousWaste/upload/HWM_FS_Generator_Requirements.pdf

Definitions

WHAT IS CRT GLASS?

Any glass released or derived from the treatment or breakage of one or more CRTs or CRT devices. CRT glass includes CRT funnel glass and CRT panel glass.

WHAT IS CRT FUNNEL GLASS?

Any glass separated from CRT panel glass derived from the treatment of one or more CRTs. CRT funnel glass consists of the neck and funnel section of a CRT, including the frit.

WHAT IS CRT PANEL GLASS?

Any glass separated from CRT funnel glass derived from the treatment of one or more CRTs. CRT panel glass consists only of the face plate of a CRT containing a phosphor viewing surface. CRT panel glass does not include the frit.

WHAT IS AN INTERMEDIATE FACILITY?

A facility that manages CRTs and/or CRT glass pursuant to article 3 of this chapter or 40 Code of Federal Regulations section 261.4(a)(22), or as a destination facility or at a foreign destination.

WHAT IS A CRT PANEL GLASS APPROVED LANDFILL?

A composite-lined portion of a unit of a solid waste landfill that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or CRT panel glass that is in compliance with section 66273.81 of this chapter.

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[19] See California Code of Regulations, title 22, division 4.5, chapter 23, section 66273.74(a)(2)