

# Managing Used Electronics and Components

Requirements for Electronics Collection, Storage, Transportation, Recycling and Reuse  
PUB-WA-1307 2019



## Table of contents

Definitions and background .....	1
Electronics disposal limitations and requirements .....	3
Identifying and managing hazardous components .....	4
Collection and storage .....	5
Transportation.....	6
Dismantling, sorting and processing.....	7
Other requirements that may apply .....	9
Appendix A: Applicable requirements for electronics with hazardous components .....	11
Appendix B: Requirements for shipping CRT devices, bare CRTs and CRT glass .....	12

Many electronics and their components can be refurbished and reused after their original owner is done with them. Electronics that cannot be reused can be dismantled for recycling, as they contain a variety of recyclable metals, plastics and glass. Many of these components contain harmful materials—such as lead, mercury, cadmium and flame retardants—and therefore require proper end-of-life management to protect workers and the environment.

There are reduced solid and hazardous waste requirements if used electronics and their components are reused or recycled. The reduced requirements are based on the types of electronics and components involved, how they are managed, and who is managing them. The reduced requirements may include conditional exclusions from hazardous waste regulation and exemptions from solid and hazardous waste licensing requirements. Used electronics and components that are not managed properly and do not meet any exclusions or exemptions are regulated more stringently.

This document provides an explanation of requirements and best management practices for individuals, governments, businesses or other organizations that collect, store, transport, recycle or refurbish electronics. The text below will generally use the term “facility” to mean any person, business or organization involved in these activities. For questions about which requirements apply to a specific situation or activity, contact the Department of Natural Resources at [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov).

For businesses, institutions or governments that generate electronic waste (e.g., computers and cellphones used by employees), see the DNR publication *Managing Used Electronics* (WA-420): [dnr.wi.gov/files/pdf/pubs/wa/wa420.pdf](http://dnr.wi.gov/files/pdf/pubs/wa/wa420.pdf)

## Definitions and background

In this document, definitions are generally used to help the reader with compliance. Those definitions that are specified in law will be noted.

**Reuse** as it relates to electronics means continued use of electronics and components for their originally intended purpose by someone else. Examples include donating or selling working electronics or components, and sending electronics or components to a refurbisher or repair shop for evaluation, testing or repair.

There are no specific state solid or hazardous waste requirements for managing used electronics and components destined solely for reuse, except for exporting cathode ray tubes (CRTs) for reuse.<sup>1</sup> Federal transportation requirements and data protection requirements may apply.

**Recycling** as it relates to electronics means processing electronics and components to recover usable materials. Recycling usually begins with dismantling electronics for recovery of components and metal, glass and plastic. In many cases, those who are refurbishing electronics for reuse also do some recycling of components.

In most cases, facilities and transporters handling electronics or components destined for recycling are exempt from Wisconsin solid waste licensing requirements. However, these requirements may apply in some cases, particularly if a facility is further processing non-metal components that have been separated from electronics or is storing electronics off-site. See more details in the sections below.

Because some electronics and components are hazardous waste, facilities and transporters need to be aware of hazardous waste requirements that may apply and of specific management practices that allow for conditional exclusion from these requirements.

## Cathode ray tubes (CRTs)

CRTs are vacuum tubes (picture tubes), composed primarily of glass, that are the visual or video display component found in most televisions and monitors made before the mid-2000s. The CRT typically makes up about 60 percent of the device weight.

The glass portion of CRTs consists of the panel, frit, funnel and neck (see Figure 1 for diagram and lead content of each component). The front panel has very low lead content, though it contains a phosphor coating that must be cleaned off before the glass can be safely reused in most situations. The funnel and neck portions of a

## Wisconsin's electronics recycling law

Wisconsin's electronics recycling law (s. 287.17, Wis. Stats.) establishes a statewide program to collect and recycle certain electronics. Manufacturers of televisions, computers, monitors and desktop printers must register with the DNR the brands they sell to Wisconsin households and schools. Those manufacturers also must recycle a target weight of electronics each year based on their sales. Manufacturers contract with registered recyclers and collectors to meet their targets. This manufacturer-funded recycling program is called E-Cycle Wisconsin.

It is not mandatory for electronics collectors and recyclers to register with E-Cycle Wisconsin unless they will be working on behalf of an electronics manufacturer. Collectors and recyclers that wish to register should contact the DNR for more information or visit [dnr.wi.gov](http://dnr.wi.gov) and search "ecycle."

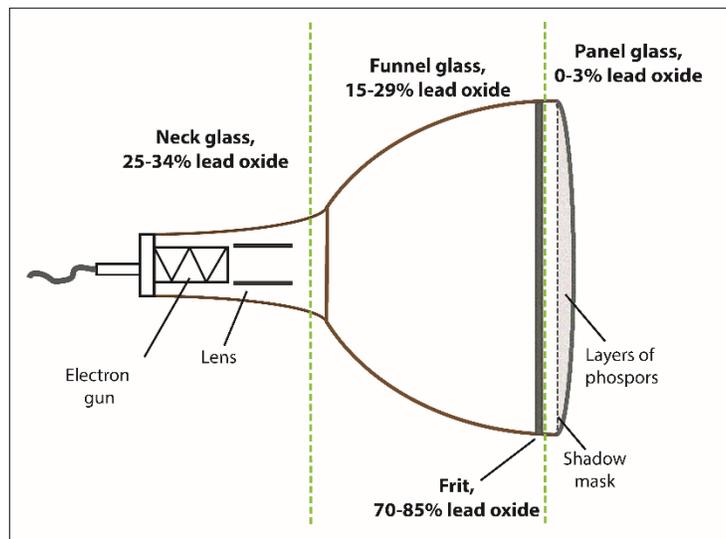


Figure 1: Cathode ray tube components and lead oxide content

<sup>1</sup> Under s. NR 661.41, Wis. Adm. Code, before exporting used, intact CRTs or CRT devices for reuse, the exporter must send a one-time notification to the U.S. Environmental Protection Agency. The exporter must retain records related to shipments for at least three years. EPA notification template:

<https://www.epa.gov/hwgenerators/template-notification-intent-export-cathode-ray-tubes-crts-reuse>

CRT have a higher lead content by weight, ranging from 15 to 34 percent. The frit is a thin line of material connecting the panel and funnel glass and is about 70 to 85 percent lead.

Under the definition in the hazardous waste rules [ s. NR 660.10(9m), Wis. Adm. Code] a **used, intact** CRT means a CRT whose vacuum has not been released. A **used, broken** CRT means glass removed from its housing or casing whose vacuum has been released.

In this document, **bare CRTs** refers to cathode ray tubes with all plastic, metal or wood casings and components removed. **CRT glass** refers to broken pieces of funnel, neck and/or panel glass. **CRT devices** refers to whole devices (such as televisions or monitors) that contain a cathode ray tube.

## Flat-panel displays

Flat-panel displays are video displays, including televisions, monitors, laptops, tablets and smartphones, with a thin screen. Most flat panels are either LCDs (liquid crystal displays) or LEDs (light-emitting diodes). LCD screens produced from the early 2000s through about 2014 were typically lit with small, thin lamps that contain mercury, called CCFLs (cold cathode fluorescent lamps). It may be difficult to determine if a flat panel display is LCD or LED unless the device is dismantled.

## Rear projection televisions

Rear projection televisions contain three CRTs (red, blue and green) within a large casing, and have a coolant (ethylene glycol and glycerin) that must be managed in the same manner as used antifreeze under hazardous waste regulations (see the next section on universal waste).

## Universal waste

Universal waste is a specific subset of hazardous waste with reduced requirements (found in ch. NR 673, Wis. Adm. Code) for collection and management of these widely generated wastes if they are properly recycled. Reduced requirements include allowing longer storage and reduced recordkeeping. Items classified as universal waste in Wisconsin commonly found in electronics include batteries, lamps (light bulbs), mercury-containing equipment (electronics with components such as mercury switches and relays) and antifreeze (coolant in rear projection televisions). Go to [dnr.wi.gov](http://dnr.wi.gov) and [search "universal waste"](#) for more information.

### Batteries and fire risk

Batteries are used in a wide variety of electronics. Some are removable from the outside; others are enclosed in the device and may be glued in. Many batteries in used electronics retain a charge, especially the lithium ion batteries that power devices like smartphones and tablets. These batteries pose a significant fire risk, especially if damaged on their way to a recycling facility or during processing.

The DNR recommends that those handling batteries make sure fire suppression systems are adequate and working properly, and that staff are trained how to spot and address smoke and fires.

## Electronics disposal limitations and requirements

The following electronics are banned from incineration or landfill disposal in Wisconsin under s. 287.07(5), Wis. Stats.:

- televisions;
- computers (desktops, laptops, netbooks and tablets);
- desktop printers (including those that scan, fax and/or copy, as well as 3-D printers);
- monitors and e-readers;
- other computer peripherals (including keyboards, mice, speakers, hard drives and flash drives);
- DVD players, VCRs and other video players (e.g., DVRs, Blu-ray players);
- fax machines; and
- cellphones.

For devices not specifically listed above, disposal requirements depend on who generated the electronics and whether the electronics contain any components regulated as hazardous waste. Households are exempt from hazardous waste requirements and can dispose of electronics other than those listed above in the trash. However, this exemption does not apply once hazardous waste is separated for management at a collection facility regulated under subch. HH of ch. NR 666, Wis. Adm. Code (such as a household hazardous waste collection facility).

Section NR 662.011, Wis. Adm. Code, requires that non-households (e.g., businesses and institutions) determine if their waste is a hazardous waste. This requirement also applies to materials/components derived from electronics that a facility would like to dispose of. For information on making a hazardous waste determination, see the DNR's *Waste Determinations and Recordkeeping* (WA-1152): [dnr.wi.gov/files/PDF/pubs/wa/wa1152.pdf](http://dnr.wi.gov/files/PDF/pubs/wa/wa1152.pdf).

If electronics used by a non-household—or materials derived from electronics, such as wood casings from console televisions—are not a hazardous waste and are not specifically banned from disposal, these items may be disposed of in a landfill or incinerator, though the DNR encourages recycling of all electronics and components whenever possible.

The DNR has specific guidance on requirements for landfill disposal of CRT glass: *Requirements for Landfill Disposal of Processed CRT Glass and E-Cycle Wisconsin Eligibility* (WA-1681): [dnr.wi.gov/files/PDF/pubs/wa/WA1681.pdf](http://dnr.wi.gov/files/PDF/pubs/wa/WA1681.pdf)

If used electronics or components are destined for disposal, solid or hazardous waste licenses or other approvals may be required. Contact [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov) with questions.

## Identifying and managing hazardous components

Nearly all electronics contain hazardous components that must be managed properly to comply with hazardous waste laws. Mismanaging hazardous components can have serious consequences for workers and the environment. Later sections of this document will include specific requirements and recommendations for handling hazardous components.

Hazardous components to be aware of when handling used electronics include the following:

- CRTs, found in televisions and monitors, which contain lead, barium, cadmium and other heavy metals.
- Circuit boards, found in all electronics, which may contain lead solder, beryllium or other heavy metals.
- Non-alkaline batteries, found in laptop computers, tablets, cellphones, MP3 players, digital cameras and other portable electronic devices. There are a wide variety of battery chemistries. These batteries typically contain heavy metals, such as cadmium, mercury and nickel. Many battery chemistries, particularly lithium ion, also pose a significant fire risk.
- Lamps, found in flat-panel displays, including televisions and monitors, scanners and other imaging devices. Fluorescent lamps contain mercury vapor, while other light sources, such as LEDs, may contain heavy metals such as lead or arsenic.
- Mercury-containing equipment (e.g., electronics containing mercury relays and switches), including some appliances, telecommunications equipment and medical equipment.
- Antifreeze/coolant (ethylene glycol), found in rear projection televisions.

See [Appendix A](#) for a table summarizing hazardous waste requirements for hazardous components found in electronics. **Please note:** Electronics and components that do not meet the hazardous waste exclusions or that are not managed according to the regulations are fully regulated as hazardous waste if they exhibit a hazardous waste characteristic identified in subch. C of NR 661, Wis. Adm. Code.

## Collection and storage

Individuals or organizations that collect, consolidate or store used electronics destined for reuse or recycling must follow the conditions of any solid or hazardous waste exemptions or exclusions to avoid more stringent regulation. Below are more details on specific requirements for CRT devices, bare CRTs and CRT glass, and batteries and devices with lithium batteries.

Most sites do not need a hazardous or solid waste storage license for electronics destined for recycling. However, if a facility—such as an electronics processing facility—stores used electronics or components off-site (e.g., not in its main facility), it will likely need a solid waste storage license under s. NR 502.05, Wis. Adm. Code. Contact [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov) with questions.

### Best management practices

The DNR also recommends best management practices to ensure electronics and components remain recyclable and therefore avoid more stringent requirements, including all of the following:

- Protect electronics from the elements as much as possible—store indoors or in covered containers, or move off-site frequently if stored outdoors.
- Minimize breakage, and follow requirements in s. NR 661.39, Wis. Adm. Code, for broken CRT glass if breakage occurs (see details in next section).
- Move electronics off-site to a recycler regularly and follow packaging guidelines to protect electronics during transportation.
- Design security procedures to protect personal and confidential data stored on devices.
- Whenever possible, have a contract with a recycler or other documentation confirming the electronics will be recycled or reused.

For a full description of electronics collection best management practices, see: *Collector Best Management Practices: Electronic Waste (WA-1735)*: [dnr.wi.gov/files/pdf/pubs/wa/wa1735.pdf](http://dnr.wi.gov/files/pdf/pubs/wa/wa1735.pdf)

### CRT devices, bare CRTs and CRT glass

Under ss. NR 661.39 and 661.40, Wis. Adm. Code, if CRT devices, bare CRTs and CRT glass are destined for specific types of legitimate recycling, they are conditionally excluded from full hazardous waste requirements—including the need to obtain a hazardous waste storage license—if they meet the requirements of those code sections and are not speculatively accumulated. If you have questions about whether a CRT end market qualifies for the exclusion, contact [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov).

### Speculative accumulation limits

To meet the speculative accumulation limit under s. NR 661.01(3)(h), Wis. Adm. Code, the amount of CRT devices, bare CRTs or CRT glass recycled or transferred to a different site for recycling during each calendar year must equal at least 75 percent by weight or volume (e.g., filled containers, number of units) of the amount of CRT devices, bare CRTs or CRT glass accumulated on-site as of Jan. 1 that year. For example, if a collector has 1,000 pounds of CRT televisions on-site as of Jan. 1, it needs to send at least 750 pounds off-site for recycling by the end of the year.

Moving the CRTs from one site to a second site owned by the same individual or company for purposes of storing at the second site would not reset the calendar for speculative accumulation. In other words, CRTs stored at the second site would still be subject to the same speculative accumulation period that began at the first site on Jan. 1 of that year.

Under s. NR 661.01(3)(h), the individual or facility accumulating the used CRTs and CRT glass must also show that the material is potentially recyclable and has a feasible means of being recycled. In general, a material has a feasible means of being recycled if there is a known market for the material and an identified recycler that will accept and recycle the material.

To demonstrate compliance with the speculative accumulation limit, the DNR recommends that sites handling CRTs do all of the following:

- label all containers/pallets with date when first CRT, CRT device or CRT glass was placed in the container or on the pallet; and
- maintain records, such as contracts and bills of lading or other shipment details, to show CRTs are going to legitimate recycling activities within the appropriate timeframe and to show compliance with speculative accumulation limits.

For questions about meeting speculative accumulation limits, contact [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov).

### **Management of broken CRT glass**

Section NR 661.39, Wis. Adm. Code, requires that sites:

- store broken CRTs or CRT glass in a building with roof, walls and floor; or
- place the CRTs or CRT glass in a leak-proof container constructed, filled and closed to minimize potential for releases (e.g., a trailer sealed by U.S. Department of Transportation standards, or a closed 55-gallon drum). Containers must be labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials.”

### **Batteries and devices containing lithium batteries**

For loose batteries or devices containing batteries, especially lithium ion batteries, sites should follow packaging and storage requirements found in ch. NR 673, Wis. Adm. Code, and recommendations to prevent fires. Go to [dnr.wi.gov](http://dnr.wi.gov) and search “universal waste” for more information.

## **Transportation**

No Wisconsin solid waste or hazardous waste transporter licenses are required if electronics are destined for **reuse** or **recycling**. However, specific labeling and packaging requirements apply for all of the following:

- CRT devices, bare CRTs and CRT glass;
- devices containing lithium batteries; and
- universal wastes, such as lamps and batteries that have been collected separately from or removed from electronics.

The DNR recommends collectors and transporters work with recyclers and other receiving facilities to make sure electronics are packaged appropriately to minimize breakage and ensure worker safety.

### **CRT devices, bare CRTs and CRT glass**

While no Wisconsin solid waste or hazardous waste license is required for transporting CRTs or CRT glass, shipping facilities and transporters should maintain records showing the materials are going to legitimate recycling activities [documenting compliance with ss. NR 661.39, 661.40 and 661.41, Wis. Adm. Code]. The DNR also recommends shipping facilities and transporters package intact CRTs to minimize breakage. Broken CRTs/CRT glass must be transported in leak-proof containers labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials” [see s. NR 661.39(1)].

See [Appendix B](#) for a table summarizing all requirements for transporting CRT devices, bare CRTs and/or CRT glass.

## Batteries, lamps and mercury-containing equipment

Some types of batteries contained in electronics present a fire risk, especially if damaged. The U.S. Department of Transportation (DOT) has specific requirements for transporting lithium batteries and devices containing lithium batteries: [www.phmsa.dot.gov/lithiumbatteries](http://www.phmsa.dot.gov/lithiumbatteries).

In addition, universal waste requirements under ch. NR 673, Wis. Adm. Code, apply to loose batteries, lamps and mercury-containing equipment, including electronics with mercury switches, relays or other mercury components. Go to [dnr.wi.gov](http://dnr.wi.gov) search “universal waste” for more information.

## Hazardous materials transportation

In addition to specific battery-related requirements mentioned above, transporters should be aware of general requirements for transporting hazardous materials. Hazardous materials are substances or materials that the U.S. Department of Transportation has determined can pose an unreasonable risk to health, safety and property when transported in commerce. Hazardous material, as defined in 49 CFR § 171.8, is subject to the applicable Hazardous Materials Regulations (HMR) in 49 CFR Parts 171 to 180. Those regulations apply to the classification, packaging, hazard communication, incident reporting, handling and transportation of hazardous materials. Visit the U.S. DOT’s Hazardous Materials Regulations webpage for more information:

[www.phmsa.dot.gov/standards-rulemaking/hazmat/hazardous-materials-regulations](http://www.phmsa.dot.gov/standards-rulemaking/hazmat/hazardous-materials-regulations)

## Dismantling, sorting and processing

Simple dismantling and sorting of electronics and components for recycling are generally exempt from Wisconsin solid waste processing license requirements under the exemption in s. NR 502.08(2)(f), Wis. Adm. Code, for scrap metal processing. However, a facility may need a solid waste approval or license for some processing activities beyond dismantling and sorting, such as processing bare CRTs or shredding electronics containing lamps. If unsure whether activities qualify for an exemption, contact the DNR to discuss the specific situation.

### Working with the DNR

Requirements for many types of electronics processing are case-specific. Processing facilities with questions about applicable requirements should contact [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov). Staff will direct facilities to appropriate regional or policy staff to ensure questions are answered in a consistent and timely manner.

If used electronics awaiting processing are stored off-site (not in the processing facility), the off-site location will likely need a solid waste storage license under s. NR 502.05, Wis. Adm. Code. Contact the DNR with questions.

Most simple dismantling, sorting, shredding and baling of used electronics for recycling is exempt from full hazardous waste requirements, if items like CRTs, circuit boards, batteries, lamps and mercury-containing components are properly managed.

The sections below have more details on how facilities can maintain compliance and avoid more stringent regulations. See also best management practices and CRT storage requirements under the [“Collection and storage”](#) section above.

## CRT devices, bare CRTs and CRT glass

Prior to disassembly and/or processing, a facility must follow all storage and labeling requirements and speculative accumulation limits outlined above for intact and broken CRTs.

If the facility is stripping CRT devices down to bare tubes and then sending bare tubes to a processor, follow the requirements listed in Table 2, [Appendix B](#).

Facilities going beyond simple dismantling of CRT devices should talk with DNR staff to determine if any additional requirements apply. Exclusions and exemptions from hazardous and solid waste requirements are case-specific and depend on factors such as the end markets for the glass.

### Third-party certifications

There are several third-party certifications electronics recyclers can obtain to demonstrate responsible management of used electronics and components. Some of the most common certifications held by recyclers include:

- e-Stewards: [e-stewards.org/](http://e-stewards.org/)
- R2: [sustainableelectronics.org](http://sustainableelectronics.org)
- NAID (data destruction): [www.naidonline.org/nit/en/cert/history-purpose.html](http://www.naidonline.org/nit/en/cert/history-purpose.html)
- RIOS [www.rioscertification.org/](http://www.rioscertification.org/)

Section NR 660.10(19)(j), Wis. Adm. Code, defines “CRT processing” as conducting **all** of the following activities:

1. Receiving broken or intact CRTs;
2. Intentionally breaking intact CRTs or further breaking or separating broken CRTs; and
3. Sorting or otherwise managing glass removed from CRTs.

If a facility’s activity meets the definition of CRT processing, s. NR 661.39(2), Wis. Adm. Code, requires that processing be done in a building with roof, floor and walls, and cannot be done at temperatures high enough to volatilize lead. Used, broken CRTs undergoing processing and processed glass are subject to the speculative accumulation limits under s. 661.39, Wis. Adm. Code, described above in the [“Collection and storage”](#) section.

If a facility is only doing #1 and #2 in the CRT processing definition, it should work with DNR staff to determine whether the activity remains exempt from solid waste processing license requirements.

If processed CRT glass is in Wisconsin and stored off-site (not at the processing facility), the off-site location must have a solid waste storage license under s. NR 502.05, Wis. Adm. Code.

If any processed CRT glass will be sent for disposal in a hazardous waste or solid waste landfill, check with DNR staff for to ensure any requirements for hazardous waste manifesting, testing or approvals for receiving landfills are in place before shipping the glass. You may also refer to the DNR’s *Requirements for Landfill Disposal of Processed CRT Glass and E-Cycle Wisconsin Eligibility (WA-1681)*: [dnr.wi.gov/files/PDF/pubs/wa/WA1681.pdf](http://dnr.wi.gov/files/PDF/pubs/wa/WA1681.pdf)

## Devices containing batteries

The DNR recommends that batteries be removed before devices are put into crushers, shredders or other machines to prevent the batteries from starting fires. Once removed, batteries must be handled as universal waste under ch. NR 673, Wis. Adm. Code, with proper labeling and storage, or they will be subject to full hazardous waste requirements, including a hazardous waste determination. Go to [dnr.wi.gov](#) and search [“universal waste”](#) for more information.

Electronics processing facilities should train staff how to handle fires caused by batteries, and ensure fire suppression systems are working at all times.

## Devices containing lamps

When handling flat-panel displays, the DNR recommends processors treat them as if every display contains mercury lamps, because there is no consistent marking/labeling on the outside of devices to indicate whether the flat-panel displays contain mercury.

If a facility is dismantling flat-panel displays by hand, it should provide appropriate personal protective equipment (PPE) for workers, have proper ventilation and train workers for dealing with broken mercury-containing lamps. Removed lamps must be managed as universal waste under ch. NR 673, Wis. Adm. Code, with proper labeling and storage requirements, or they will be subject to full hazardous waste requirements. Go to [dnr.wi.gov](http://dnr.wi.gov) and search “universal waste” for more information.

Processors should be aware that other devices, particularly scanners or similar imaging devices, may also contain lamps that should be managed according to universal waste requirements.

If lamps are not removed before devices are put into crushers, shredders or other processing equipment for recycling, the activity does not qualify for the solid waste processing license exemption under s. NR 502.08(2)(f), Wis. Adm. Code. Facilities planning to shred whole flat-panel displays or other devices that contain lamps should contact the DNR to determine if the activity requires a solid waste processing approval or license. To maintain compliance with the NR 600 administrative rules and ensure worker safety, the facility should have proper air filtration systems in place to capture mercury.

## **Devices containing mercury switches, relays or other mercury components**

Mercury switches, relays or other mercury-containing components should be removed before devices are put into crushers, shredders or other machines. Once removed, mercury-containing components must be handled as universal waste under ch. NR 673, Wis. Adm. Code, with proper labeling and storage, or they will be subject to full hazardous waste requirements. Go to [dnr.wi.gov](http://dnr.wi.gov) and search “universal waste” for more information.

## **Shredding circuit boards**

Hazardous waste requirements do not apply to shredding circuit boards for recycling if the facility meets the following conditions in s. NR 661.04(1)(n), Wis. Adm. Code:

- remove batteries (nickel cadmium and lithium), mercury switches and mercury relays before shredding; and
- store and transport boards in containers that prevent releases to the environment.

## **Other requirements that may apply**

### **Requirements for handling appliances with refrigerants**

Collectors, transporters and processors that handle refrigerant-containing appliances, such as refrigerators, freezers, air conditioners and dehumidifiers, must follow state and federal regulations for safe transport and refrigerant recovery. Ch. NR 488, Wis. Adm. Code, requires that anyone transporting salvaged refrigeration equipment certify annually to the DNR’s Air Program that they will transport items in a manner that prevents refrigerant releases. Any private or public entity responsible for recovering regulated refrigerants from any type of equipment being salvaged must register annually with the DNR.

For more information, visit DNR’s refrigerant recovery program webpage:

[dnr.wi.gov/topic/airquality/refrigerants.html](http://dnr.wi.gov/topic/airquality/refrigerants.html)

### **Stormwater regulations**

Businesses storing scrap materials outside for long periods of time may fall under state stormwater regulations in ch. NR 216, Wis. Adm. Code, and may need a permit under the “Recycling of scrap and waste materials” general permit for facilities with bulk storage piles of scrap material. If unsure whether your location requires a permit, contact regional DNR stormwater staff:

[dnr.wi.gov/topic/stormwater/contacts.html](http://dnr.wi.gov/topic/stormwater/contacts.html).

## Occupational safety and health

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) regulations in 29 CFR Part 1910 require private employers to protect their workers from safety and health hazards. The Wisconsin Department of Safety and Professional Services Public Employee Safety and Health standards in ch. SPS 332, Wis. Adm. Code, require public employers to do the same.

## Hazardous substance discharges (spills)

Wisconsin's hazardous substance spills law (ch. 292, Wis. Stats.) requires immediate notification to the DNR (by calling 800-943-0003) of all discharges of hazardous substances to the environment, and requires those responsible to properly contain, clean up and dispose of the substance and associated contaminated soil, water and other affected materials.

Visit [dnr.wi.gov](http://dnr.wi.gov) and search "spills" for more information.

## Data protection

Those collecting and processing electronics, particularly from businesses, institutions or governments, should be aware of federal privacy requirements for health information under HIPAA (Health Insurance Portability and Accountability Act) and educational information under FERPA (Federal Educational Rights and Privacy Act), as well as other government regulations or customer privacy policies.

The following webpages have more information on these requirements.

- HIPAA: [www.hhs.gov/hipaa/index.html](http://www.hhs.gov/hipaa/index.html)
- FERPA: [www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html](http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html)

## More information

For more information on this subject, including other publications, staff contacts and administrative codes and statutes, go to [dnr.wi.gov](http://dnr.wi.gov) and search "ecycle." For more information about managing universal waste, go to [dnr.wi.gov](http://dnr.wi.gov) search "universal waste."

**Mailing address:** DNR Waste & Materials Management Program, PO Box 7921, Madison, WI 53707

**Email:** [DNRWle-cycling@wisconsin.gov](mailto:DNRWle-cycling@wisconsin.gov)

***Disclaimer:** This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.*

***Equal Opportunity Employer and Americans with Disabilities Act Statement:** The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Chief, Public Civil Rights, Office of Civil Rights, U.S. Department of the Interior, 1849 C. Street, NW, Washington, D.C. 20240.*

*This publication is available in alternative format (large print, Braille, etc.) upon request. Please call 608-266-2111 for more information. Note: If you need technical assistance or more information, call the Accessibility Coordinator at 608-267-7490 / TTY Access via relay – 711.*

## Appendix A: Applicable requirements for electronics with hazardous components

Table 1 summarizes requirements for hazardous components commonly found in electronics.

**Please note:** Electronics and components that do not meet the hazardous waste exclusions or that are not managed according to the regulations are fully regulated as hazardous waste if they exhibit a hazardous waste characteristic identified in subch. C of ch. NR 661, Wis. Adm. Code.

**Table 1: Applicable requirements for hazardous electronics components**

Component	Found in	Requirements
Intact or broken CRTs	Televisions, computer monitors	Conditionally excluded from most hazardous waste requirements if managed according to ss. NR 661.39 and 661.40, Wis. Adm. Code
Circuit boards	All electronics	Shredded circuit boards managed according to s. NR 661.04(1)(n), Wis. Adm. Code, are conditionally excluded from other hazardous waste requirements  Whole, unused circuit boards are classified as an off-specification commercial chemical product and when reclaimed under s. NR 661.02(3), Wis. Adm. Code, are not a solid waste under the NR 600 series  Whole, used circuit boards are classified as scrap metal and are regulated under s. NR 661.06(1)(c)2
Non-alkaline batteries	Laptop/notebook computers, tablets, cellphones, MP3 players, digital cameras, other portable electronic devices	Once removed, exempt from full hazardous waste requirements if managed as universal waste under ch. NR 673, Wis. Adm. Code  U.S. Department of Transportation requirements apply for transportation of lithium batteries (including those contained in devices)
Lamps	Flat-panel displays, including televisions and monitors; scanners and other imaging devices	Once removed, exempt from full hazardous waste requirements if managed as universal waste under ch. NR 673
Mercury-containing equipment (electronics with mercury -containing components such as relays and switches)	Appliances, telecommunications equipment, medical equipment	Once removed, exempt from full hazardous waste requirements if managed as universal waste under ch. NR 673, Wis. Adm. Code
Antifreeze/coolant (ethylene glycol)	Rear projection televisions	Once removed, exempt from full hazardous waste requirements if recycled, per DNR Management of Universal Wastes in Wisconsin memo (WA-742)

## Appendix B: Requirements for shipping CRT devices, bare CRTs and CRT glass

Table 2 summarizes state and federal requirements for transporting CRT devices, bare CRTs and CRT glass. No solid waste transporter license is required for transporting CRTs or CRT glass. The DNR recommends that shipping facilities and transporters ensure intact CRTs are packaged to minimize breakage.

**Table 2: Requirements for shipping CRT-containing devices, bare CRTs and CRT glass**

Material type	Destination	Requirements
CRT devices, bare CRTs or CRT glass	Storage, consolidation, sorting or CRT processing facility in the United States	Maintain records to show CRTs are going to legitimate recycling activities [documenting compliance with ss. NR 661.39, 661.40 and 661.41, Wis. Adm. Code]  Broken CRTs/CRT glass must be transported in leak-proof containers labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials.” [s. NR 661.39(1)]
Intact CRTs/ CRT devices	Exporting for reuse	Submit one-time notification to U.S. EPA and maintain records demonstrating reuse. [s. NR 661.41].
Intact or broken CRTs	Exporting for recycling	Comply with export requirements under ss. NR 661.39 and 661.40, Wis. Adm. Code, including: <ul style="list-style-type: none"> <li>• Demonstrate CRTs are being exported for legitimate recycling under <a href="#">40 CFR § 280.43</a> <ul style="list-style-type: none"> <li>○ Glass manufacturing or lead smelting [s. NR 661.39 (3)]</li> <li>○ Use as a fluxing agent at copper smelters. [<a href="#">U.S. EPA memo (RCRA Online #14835)</a>]</li> <li>○ Use as substitute for lead oxide in production of ceramic tile. [<a href="#">U.S. EPA Background Paper (RCRA Online #14855)</a>]; s. NR 661.02(5)]</li> <li>○ Other end uses must meet <a href="#">criteria for legitimate recycling in 40 CFR § 260.43</a>; otherwise full hazardous waste/Resource Conservation and Recovery Act (RCRA) requirements apply</li> </ul> </li> <li>• Notify U.S. EPA at least 60 days before export, receive acknowledgement of consent and notify EPA of changes. Include copy of acknowledgement of consent with all shipments</li> <li>• Submit Electronic Export Information to Protection and submit annual report to EPA</li> <li>• Regular renewals of notification and consent required</li> <li>• Broken CRTs/CRT glass must be transported in leak-proof containers labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials.”</li> </ul>

Material type	Destination	Requirements
Processed CRT glass	U.S. secondary processing/ end markets	<p>Make sure facility receiving glass has all needed approvals or licenses</p> <p>For funnel glass, ensure end markets are eligible for hazardous waste exclusions; otherwise, hazardous waste transporter and manifesting requirements apply</p> <ul style="list-style-type: none"> <li>• Glass manufacturing or lead smelting. [s. NR 661.39(3), Wis. Adm. Code]</li> <li>• Use as a fluxing agent at copper smelters. [<a href="#">U.S. EPA memo (RCRA Online #14835)</a>]</li> <li>• Use as substitute for lead oxide in production of ceramic tile. [<a href="#">U.S. EPA Background Paper (RCRA Online #14855)</a>]; s. NR 661.02(5)]</li> </ul> <p>Transport funnel glass/frit in leak-proof containers labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials.” [s. NR 661.39(1)]</p> <p>For panel glass, test regularly to ensure it is not hazardous waste [s. NR 662.011]</p>
Processed CRT glass	Exporting to end market	<p>No export notification required if processed glass is going to:</p> <ul style="list-style-type: none"> <li>• Glass manufacturing or lead smelting. [s. NR 661.39 (3), Wis. Adm. Code]</li> <li>• Use as a fluxing agent at copper smelters. [<a href="#">U.S. EPA memo (RCRA Online #14835)</a>]</li> <li>• Use as substitute for lead oxide in production of ceramic tile. [<a href="#">U.S. EPA Background Paper (RCRA Online #14855)</a>]; s. NR 661.02(5)]</li> </ul> <p>Other end uses must meet <a href="#">criteria for legitimate recycling in 40 CFR § 260.43</a>; otherwise full hazardous waste/RCRA requirements apply</p> <p>Transport in leak-proof containers labeled “Used cathode ray tubes – contains leaded glass” or “Leaded glass from televisions or computers.” AND “Do not mix with other glass materials.” [NR 661.39(1)]</p>

For more about requirements for exporting CRTs and CRT glass, see the U.S. EPA’s website with FAQs: [www.epa.gov/hw/frequent-questions-about-regulation-used-cathode-ray-tubes-crts-and-crt-glass](http://www.epa.gov/hw/frequent-questions-about-regulation-used-cathode-ray-tubes-crts-and-crt-glass)