



Requirements and Best Practices for Electronics Collection

DNR ELECTRONICS COLLECTOR VIRTUAL WORKSHOP – NOVEMBER 29, 2022

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Importance of Best Management Practices (BMPs)

- ▶ Maintain recyclability of materials
- ▶ Site safety for both staff and customers
- ▶ Provide better efficiency for site management
- ▶ Protect human and animal health
- ▶ Protect the environment
- ▶ Reduces hazardous waste requirements for electronics destined for recycling if certain conditions are met

Collector Best Management Practices: Electronic Waste

Proper handling of electronic waste protects site workers and the public and prevents pollution. It can also make electronics much more recyclable, and therefore profitable, than improper handling. The following list of best management practices for electronics collection sites could help save the entire electronics collection system money while making your site safer. Most of the suggestions below are not laws or specific requirements under the E-Cycle Wisconsin program, but will help protect human health and the environment.

Site selection

The ideal place to store collected electronics is in an indoor location. The next best option is in covered containers. The idea behind both storage techniques is to keep electronics out of the elements so that they do not crack, leak and weather. If covered storage is not possible, frequent pick-ups by your recycler can help make sure electronics remain recyclable.

Broken cathode ray tubes (CRTs) must be stored in a building with roof, floor and walls and in a container designed and constructed to contain dust.

Electronics contain valuable materials and sensitive data. It is a good idea to secure your site by locking buildings and gates and monitoring with video cameras to protect from theft, vandalism and illegal dumping. You may also want to store electronics in locked containers, especially if it is difficult to prevent unwanted access to your site.



This covered roll-off container provides indoor storage and can be locked for security purposes.

Storage

Every collection site stores electronics in slightly different ways. Regardless of storage methods the following three practices apply:

- ✓ Keep all storage areas clean and orderly.
- ✓ Have an attendant on duty during open hours for security and to prevent mishandling and breakage of electronics.
- ✓ Send all materials off-site for recycling within one year of their arrival.

Work with your recycler to find the best way to store and package electronics so that it works for both of you while minimizing breakage. Recyclers will often provide you with packaging and may assist you in loading materials onto a truck. The suggestions below work for most sites, but if you use large roll-off containers only the stacking practices may apply to you.

Site selection

- Locked building
- Enclosed trailers or sheds
- Outdoor storage with frequent removal
- Consider traffic flow and visibility from road
- Litter issues
- Illegal dumping



Best alternatives to buildings

- ▶ Enclosed trailers
- ▶ Staged semi-trailer
- ▶ Containers or pallets to keep electronics off the ground
- ▶ Covered/sheltered area



Outdoor storage

- ▶ No protection from weather, vandalism or theft
- ▶ Difficult to clean up broken materials
- ▶ If outdoor storage is only option:
 - ▶ Place on pallets and prepare for shipping
 - ▶ Use a paved area
 - ▶ Arrange for more frequent shipping
 - ▶ Consider closing collection site in the winter



Security

- ▶ Gated
- ▶ Cameras
- ▶ Hours posted
- ▶ Citations posted
- ▶ Data security



Packaging electronics

- ▶ Talk to your recycler about their requirements
- ▶ Keep site safety in mind
- ▶ Consider stack height (5-7 feet max)
- ▶ Watch for cords
- ▶ Stability of Gaylords and palletized materials
- ▶ Maintain aisle space
- ▶ Prepare and train staff on site safety plan
- ▶ Minimize chance for breakage
- ▶ Consolidate smaller electronics in Gaylords
- ▶ Send materials off-site to a legitimate downstream vendor within 1 year!



Sorting electronics

- ▶ Label containers
 - ▶ Date first item was placed into it
 - ▶ Contents – be as specific as possible (TVs, Monitors, etc.)
 - ▶ Mixed electronics is an acceptable label for small items that are consolidated (e.g. mice, keyboards, etc.)
- ▶ Keep non-eligible electronic devices (non-EEDs) separate
 - Eligible items must come from households and K-12 schools
 - Not on the list of eligible devices

Note: remove extraneous labels

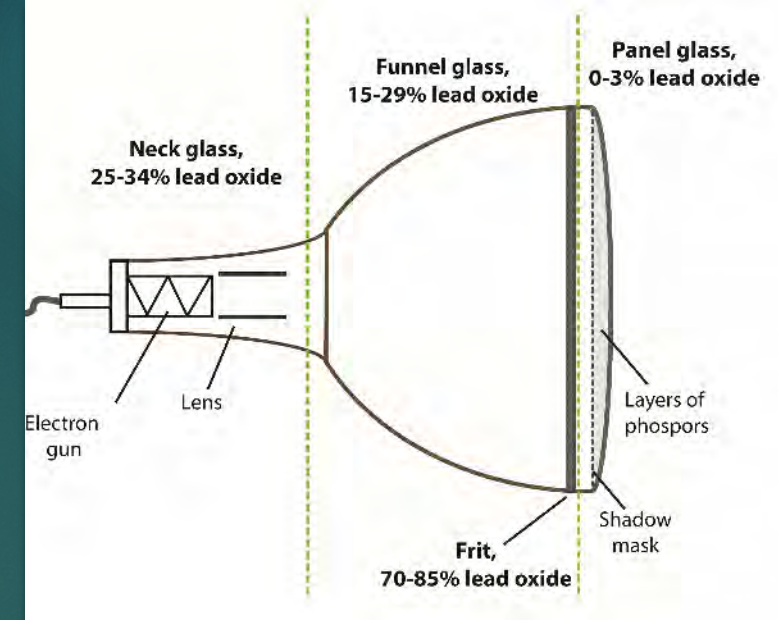


Eligible electronic devices include:

- televisions;
- computers (desktop, laptop, netbook and tablet computers);
- desktop printers (including those that scan, fax and/or copy and 3-D printers);
- computer monitors;
- other computer accessories (including keyboards, mice, speakers, external hard drives and flash drives);
- e-readers;
- DVD players, VCRs and other video players (i.e., DVRs); and
- fax machines.

Site operator training

- ▶ Establish a procedure for broken and damaged electronics
- ▶ Electronics contain some hazardous materials that require special management
 - ▶ Older style TVs contain cathode ray tubes with high lead content
 - ▶ LCD TVs and monitors contain fluorescent tubes with mercury



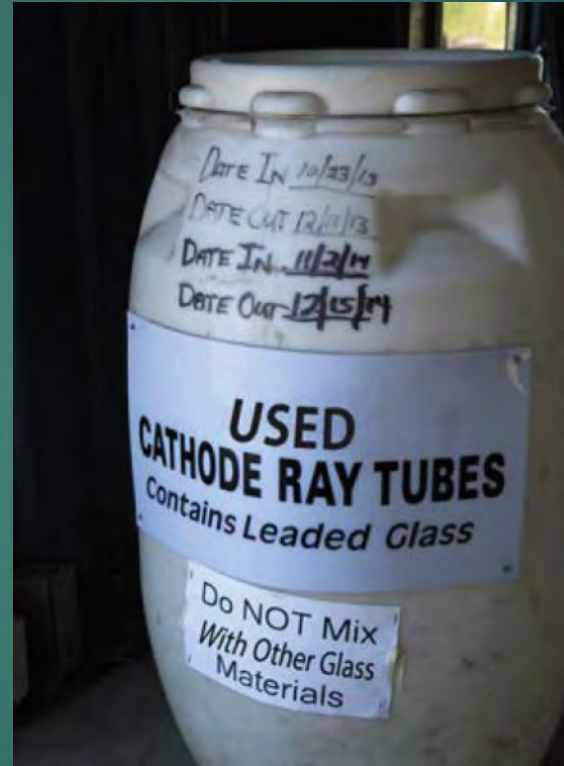
Devices containing lithium batteries

- Fire risk when batteries are damaged
- Watch for swelling/visibly damaged batteries and place in sand or kitty litter to prevent “thermal event”
- USDOT transportation requirements:
www.phmsa.dot.gov/lithiumbatteries
- Call2Recycle battery safety training and resources
Call2recycle.org
- DNR battery resources:
dnr.wi.gov/topic/recycling/batteries.html



Broken CRT glass

- Storage – Must be in a building with a roof, floor, and walls or a container constructed to minimize releases (lined or completely sealed Gaylord)
- Label - “Used cathode ray tubes - contains leaded glass” OR “Leaded glass from televisions or computers” AND “Do not mix with other glass materials”
- May not be speculatively accumulated – MUST BE shipped to a legitimate downstream vendor within 1 year!



Recordkeeping

Clear separation between eligible and non-eligible devices

Where materials go downstream—including end markets for hazardous materials

Keep independent records – DO NOT rely on recycler's records (BMP)

Record and report all collection events or sites

Maintain records for minimum of 3 years

Tracking tool

► [Electronics Collection Site Weight Tracking Template](#)

► Contact us to request Word or Excel version

Electronics Collection Site Weight Tracking Template

Collection site name and location:

Date started collecting:

Date load picked up:

Hauler name:

Receiving recycler or collector name:

Receiving recycler or collector address:

Materials sent off-site

If your site sorts/packages electronics in different categories than those below, you can adjust category types accordingly.

Type of electronics	Number of Gaylords	Number of pallets	Single items	Total estimated pounds (See chart on page 2)
CRT (or mixed) TVs and monitors				
Flat panel TVs and monitors				
Plasma or projection TVs				
Desktop computers				
Laptops/Tablets				
Desktop printers				
Video players (i.e., DVD player, VCR, etc.)				
Mixed peripherals				
Mixed electronics				
Non-eligible electronics*				
Other:				
Other:				

* Only eligible electronic devices (EEDs) can be counted under E-Cycle Wisconsin. EEDs include desktop, laptop and tablet computers; desktop printers, video display devices (e.g., TVs, monitors, e-readers), video players (e.g., DVD players, VCRs); fax machines and computer/gaming/cellphone peripherals received from households and K-12 schools. Refer to dnr.wi.gov/topic/ecycle/wisconsin.html for specific definitions of EEDs. All materials from businesses and institutions are non-EEDs and should not be included in the categories above. You can use a separate form, or if your site receives a minimal amount, you can put them in the other category and clearly designate it as non-eligible weight.

Developed by the Wisconsin Department of Natural Resources. Last revised April 2022

Average weights of electronics

Type of electronics	Gaylord or pallet	Single items
CRT (or mixed) TVs and monitors	400-700 lbs.	19 inches or less = 45 pounds Greater than 19 inches = 100 pounds
Flat panel TVs and monitors	500-1000 lbs.	less than 40 inches = 20 pounds 40 inches or greater = 65 pounds
Plasma or projection TVs	300-700 lbs.	less than 40 inches = 40 pounds 40 inches or greater = 75 pounds
Desktop computers	600-1000 lbs.	25 pounds
Laptops/Tablets	800-1000 lbs.	Laptop - 5 pounds Tablet - 1-2 pounds
Cellphones	n/a	.33 pounds
Desktop printers	500 -600 lbs.	15 pounds
Video players (i.e. DVD players, VCRs, etc.) and video game consoles	500-600 lbs.	7.5 pounds
Mixed peripherals	500-600 lbs.	2 pounds
Mixed electronics	500-800 lbs.	N/A

E-Cycle Wisconsin collectors should maintain records of the dates they sent eligible electronics to another registered collector or registered recycler, along with the bill of lading, scale receipt or approximate weight size of the load. If electronics are not weighed at your collection site, you can use this form to help estimate weights collected. Those estimates can then be compared to the records provided by your recycler. This form is a sample of how you can track weights, but you may prefer to use a different tracking method that fits your needs. It is important to ensure collectors independently track weights or estimates of weights and do not solely rely on records provided by your hauler, recycler or other destination facility.

You do not need to submit this form to the Department of Natural Resources. It is a tool that can help you verify the accuracy of weight reports received from recyclers and follow up with discrepancies. It may also be useful to refer to during an inspection. Collectors should maintain records for 3 years.

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Program economics

Consider collection frequency

- ▶ Hold special collection events one or more times/year
- ▶ Operate a permanent collection site (could be limited hours)

Additional options for either events or permanent sites:

- ▶ Restrict access (only customers or residents of a certain area)
- ▶ Restrict number of items per visit
- ▶ Restrict type of items
- ▶ Charge a fee

Fee options

Price/lb

- ▶ Matches how recyclers charge, but requires a scale and more labor at site
- ▶ Less predictable for customers

Price/item

- ▶ Requires staff at site to tally items, but deal with predictable, whole dollar amounts
- ▶ Many do a graduated scale for different size/type of TVs

Flat fee for access to site

- ▶ Easy to administer, but might not cover all costs
- ▶ Could charge a flat fee for a limited number of items, add per-item fee if someone brings additional electronics



How to handle...

UNIVERSAL WASTE

[As per NR 673 W.A.C. Refer to code for details.]



TRAIN

Employees who handle universal waste require training.
Keep training records.

KEEP CLOSED

All containers of used lamps, antifreeze, pesticides and mercury-containing equipment must be kept closed.

LABEL

All containers or individual items must be correctly labelled.

DATE

Containers or individual items must be labelled with the date when the item was first placed in the container or the date when the item became waste.

REMOVE

Waste must be picked up or taken for recycling within one year of the date on the container.



GOT A LEAK?

Any items that are leaking or damaged must be contained in closed, leakproof containers.

IMPORTANT REMINDER...

If not managed as universal waste, these items must be managed as hazardous waste.

dnr.wi.gov, search "universal waste"
608-266-2111



PLB-WA-17581 2015

REFRIGERANT RECOVERY PROGRAM

Wisconsin law prohibits the release of regulated refrigerants into the atmosphere.

The release of regulated refrigerants generally occurs as refrigeration and air-conditioning equipment is salvaged or dismantled for disposal. The refrigeration chemicals inside the equipment must be properly recovered using approved equipment operated by qualified technicians.

Any person who salvages or dismantles refrigeration equipment is required under [NR 488, Wis. Adm. Code](#) [\[exit DNR\]](#), to obtain annual DNR registration.

Notice: Some web browsers do not open PDF files on their own. If you experience trouble opening or filling out a PDF form, visit the DNR [PDF help](#) for instructions on how to successfully open PDF files.

- Overview
- Registration
- Safe transport
- Facility lists
- FAQ
- DOT salvagers

REGISTERED FACILITIES

The DNR maintains lists of facilities registered in its Refrigerant Recovery and Safe Transport Programs. The lists are updated approximately every three months. Please note that some of the listed facilities perform work only for their company and do not take refrigeration equipment from the public. Therefore, contact any facility before bringing refrigeration equipment to a registered facility. In addition, there may be costs associated with these services.

SALVAGERS/DISMANTLERS

These are lists of facilities currently registered under Chapter NR 488, Wis. Adm. Code, to recover refrigerants from items being salvaged. Those classified as "Type 1" (see Type column) are authorized to recover refrigerants from vehicle air conditioners (vehicle salvagers). "Type 2" facilities may recover refrigerants from stationary equipment such as appliances, building air conditioners and commercial refrigeration equipment (e.g., appliance salvagers and HVAC companies). Those classified as "Type 3" may recover refrigerants from both vehicles and stationary equipment.

- [Salvagers/Dismantlers - Sorted Alphabetically](#) [\[pdf\]](#)
- [Salvagers/Dismantlers - Sorted by County](#) [\[pdf\]](#)

SAFE TRANSPORTERS

Air quality

[View Current Air Quality](#)

[Contact Air Program Staff](#)

[Air News and Subscriptions](#)

[Air Quality Monitoring](#)

[Air Pollutants and Standards](#)

Additional Resources

[Refrigerant program fact sheet \(AM-552\)](#) [\[PDF\]](#)

[DNR Violation Hotline](#)

[Compliance Assistance](#)

[EPA Ozone Layer Protection](#) [\[exit DNR\]](#)

[Wisconsin's Refrigerant Recovery Rule](#) [\[PDF exit DNR\]](#)

[Large Appliance Recycling Guide](#) [\[PDF exit DNR\]](#)

For information on other air toxics, contact:

Jeff Myers

Air toxicologist

Air Program

tel: +1-608-266-2879

<https://dnr.wi.gov/topic/AirQuality/Refrigerants.html>



Resources for collectors



Collector best management practices handouts and videos

“What happens when I e-cycle?” video

Tips for choosing a responsible electronics recycler

“Your role” overview for RUs

Updated collector FAQs

<http://dnr.wi.gov/topic/Ecycle/collectors.html>



DNR website: <https://dnr.wi.gov/topic/ecycle>

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