

Scrap Metal

A Checklist for Recycling Scrap Metal



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Habitat For Humanity Waterloo Region

200 Preston Parkway, Cambridge, ON

Written by: Michael Senecal



The first step in processing and recycling scrap metal is to identify what type of metal it is. The two most common categories are **ferrous** and **non-ferrous** metals. Using a *magnet* is the easiest way to identify what type of metal you are processing.

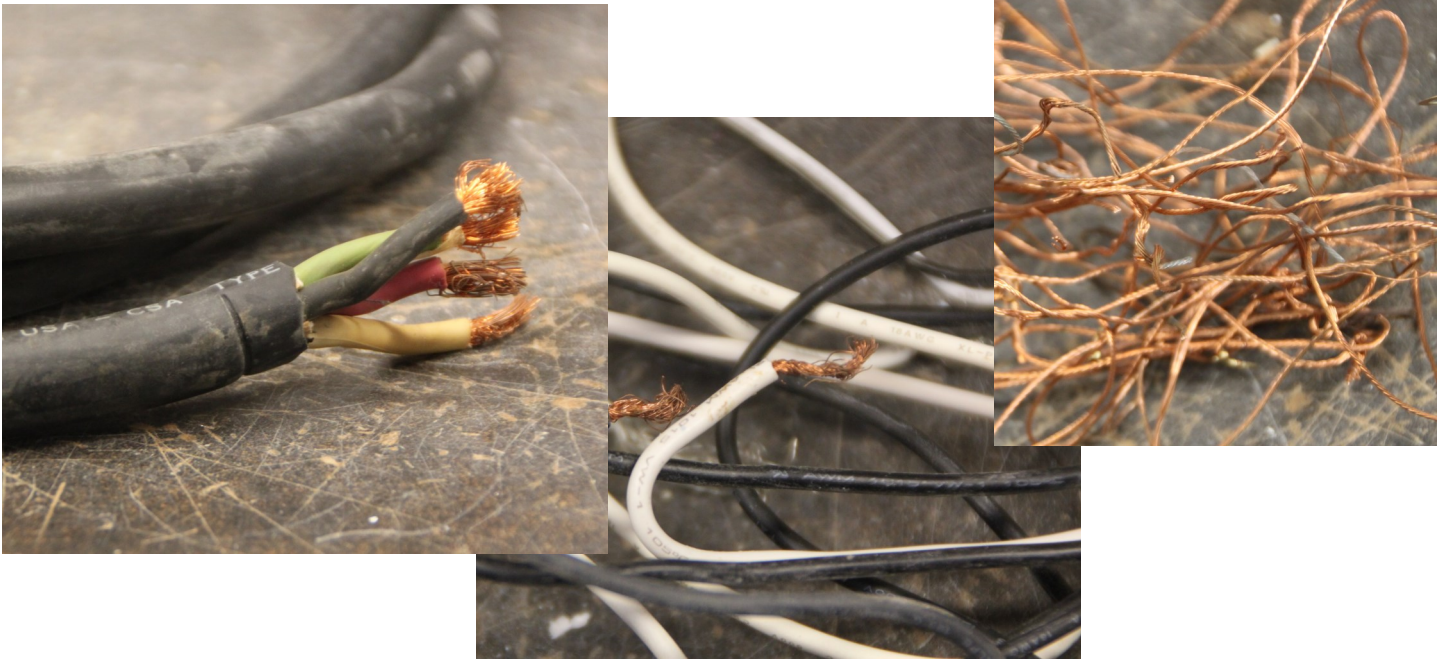
Ferrous Metals

Ferrous is a denser, heavier metal used to make appliances and building materials. These metals are **magnetic** because they are made of iron and steel or contain trace amounts of iron.

Non-ferrous Metals

Non-ferrous metals are usually lighter and less dense compared to ferrous metals. These metals contain little to no traces of iron and, therefore, are **non-magnetic**.

Now that we have established what ferrous and non-ferrous metals are, you can use a magnet to see what type of metal you are processing for recycling. If the metal sticks to the magnet (**ferrous**), go to *page 14*. If the metal does not stick to the magnet (**non-ferrous**), go to the next page.



COPPER WIRES

Copper wires have one of the highest values when it comes to recycling scrap metal. There are several different types of copper wiring that vary in value depending on their gauge (size) and condition.

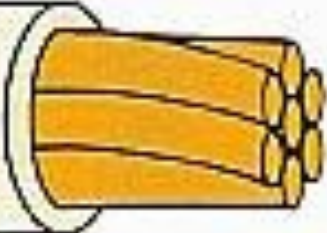
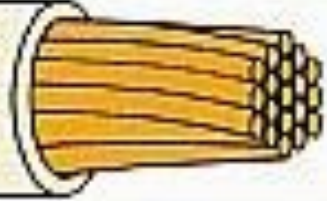
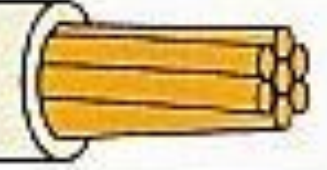





Common items where you will find copper wires:

- Indoor and outdoor lights
- Electronics
- Household Appliances
- Power Tools
- Ceiling Fans

Sorting Copper Wire Checklist

- **SEPARATE THE COPPER WIRE FROM OTHER MATERIALS**—the copper wire should only be copper wires and nothing else. Separate the wire from the device and remove all other materials from the cable, including labels and connectors.
- **PLACE THE COPPER WIRE IN THE PROPER BIN**—figure out what gauge the cable is and place it in the proper bin.

COPPER WIRE GAUGE CHART

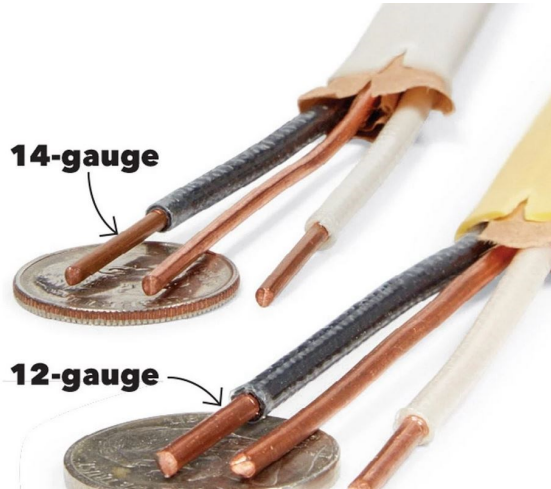
3/0 Gauge		200 Amps Service entrance
1/0 Gauge		150 Amps Service entrance and feeder wire
3 Gauge		100 Amps Service entrance and feeder wire
6 Gauge		55 Amps Feeder and large appliance wire
8 Gauge		40 Amps Feeder and large appliance wire
10 Gauge		30 Amps Dryers, appliances, and air conditioning
12 Gauge		20 Amps Appliance, laundry and bathroom circuits
14 Gauge		15 Amps General lighting and receptacle circuits

How To Wire It. Retrieved by <https://www.how-to-wire-it.com/romex-cable.html>

Copper Wire Gauge Examples

14 Gauge Copper Wiring:

- Indoor and Outdoor Lights
- Electronics
- Small Kitchen Appliances
- Table Lamps
- Ceiling Fans



(Holden, 2022)

10 Gauge Copper Wiring:

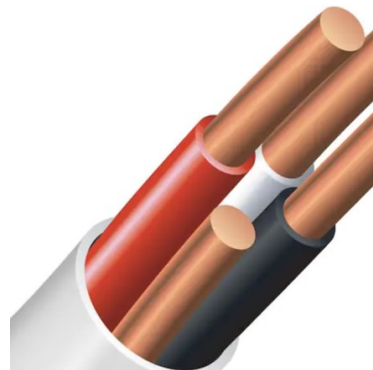
- 240 Window Air Conditioners
- Dryers
- Commercial Machine and Tools



(conquerall)

8-6 Gauge Copper Wiring

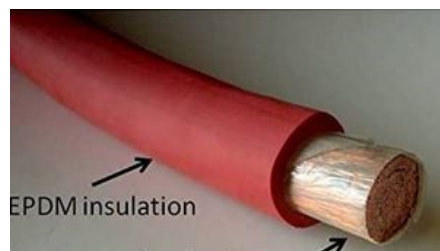
- Electric Dryers
- Electric Ovens
- Heavy Duty Appliances
- Air Conditioners



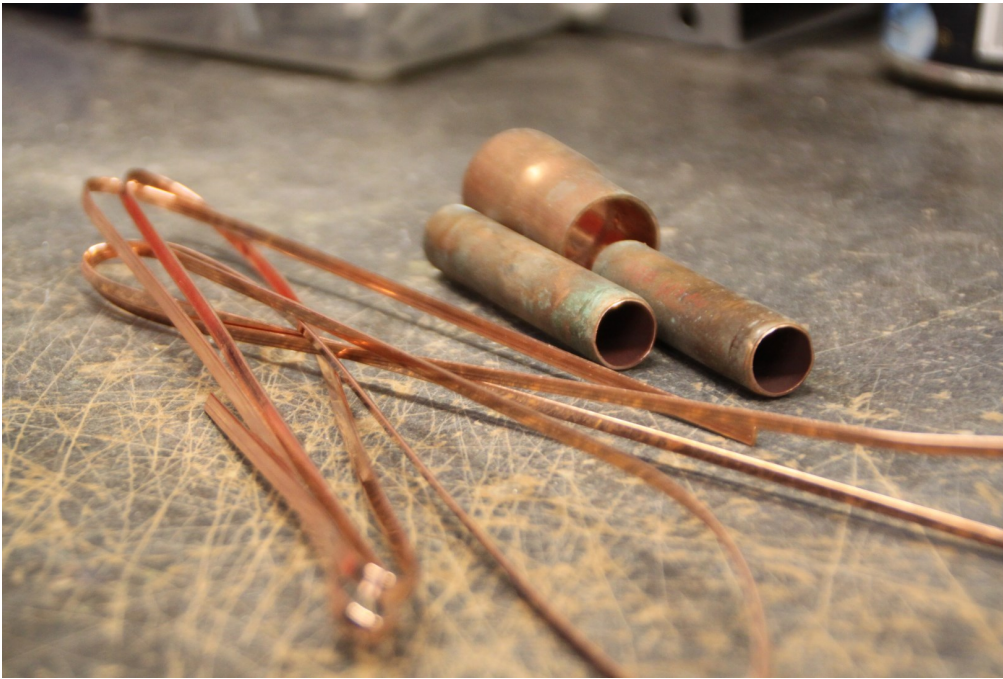
3-1/0 Gauge Copper Wiring

- Heavy Duty Appliances
- AC Motors
- Breaker Panels
- Dust Collectors

(Southwire 8/3 NMD90 40M Romex SIMpull Electrical Wire - White)



(6 Gauge 6 AWG 20 Feet Black)



COPPER NUMBER 1

A soft reddish metal used to build plumbing materials, electrical cables and computer components. It is a non-magnetic element, so it should not go into Shred Metal.

Common items where you will see:

- Copper pipes
- Electrical/heating conduits
- Kitchen pots and pans

Sorting Copper (1) Checklist

- **MAKE SURE IT IS COPPER**—some materials may look like copper but are, in fact, some other metal with a copper finish on the surface. Check with a magnet, and then remove a layer of the finish with a file or grinder to see if it looks like copper.
- **SEPARATE THE COPPER FROM OTHER MATERIALS**—Copper should only be copper and nothing else. Remove any set screws or use a cutting tool to remove all the other materials from the copper.
- **PLACE IN RECYCLING BIN LABELLED “COPPER#1”**



BRASS NUMBER 1

Brass is a slightly heavier and denser metal made out of traces of copper and zinc. This metal is used to make up décor for furniture and hardware for interior doors. It is also used to make plumbing and gas fittings for its resistance to corrosion.

Common items you will see:

- Musical instruments
- Cabinet Hardware
- Bathroom fixtures
- Some furniture (cabinets and dressers)

Sorting Brass (1) Checklist:

- **MAKE SURE IT IS BRASS**—like copper, some materials may look like brass but might be another metal with a brass finish on the surface. Always check with a magnet and use a file or grinder to remove a layer of the surface to ensure it is brass.
- **SEPARATE THE BRASS FROM OTHER MATERIALS**—Brass should only be brass and nothing else. Remove any screws with a screwdriver or drill, or use a cutting tool to remove all the other materials from the brass.
- **PLACE BRASS IN THE RECYCLING BIN LABELLED “BRASS#1”**



COPPER NUMBER 2

Copper that is combined with other materials to make a fitting or component in commercial construction. The copper, at this point, is too difficult to separate and should be placed in another category known as “COPPER NUMBER 2.” For example, a plumbing fitting with more copper than brass is considered Copper Number 2.

Common items you will see:

- Plumbing and gas fittings
- Machinery
- Copper wires

Sorting Copper (2) Checklist

- **MAKE SURE THERE IS MOSTLY COPPER** —it doesn’t have to be only copper, but it should be mostly copper before placing it in the bin. Use a magnet or file to make sure it is actually copper.
- **SEPARATE MOST OF THE OTHER MATERIALS FROM THE COPPER**—remove as much of the other materials as possible to get the most value out of the copper.
- **PLACE THE METAL IN THE BIN LABELLED “COPPER#2”**



BRASS NUMBER 2

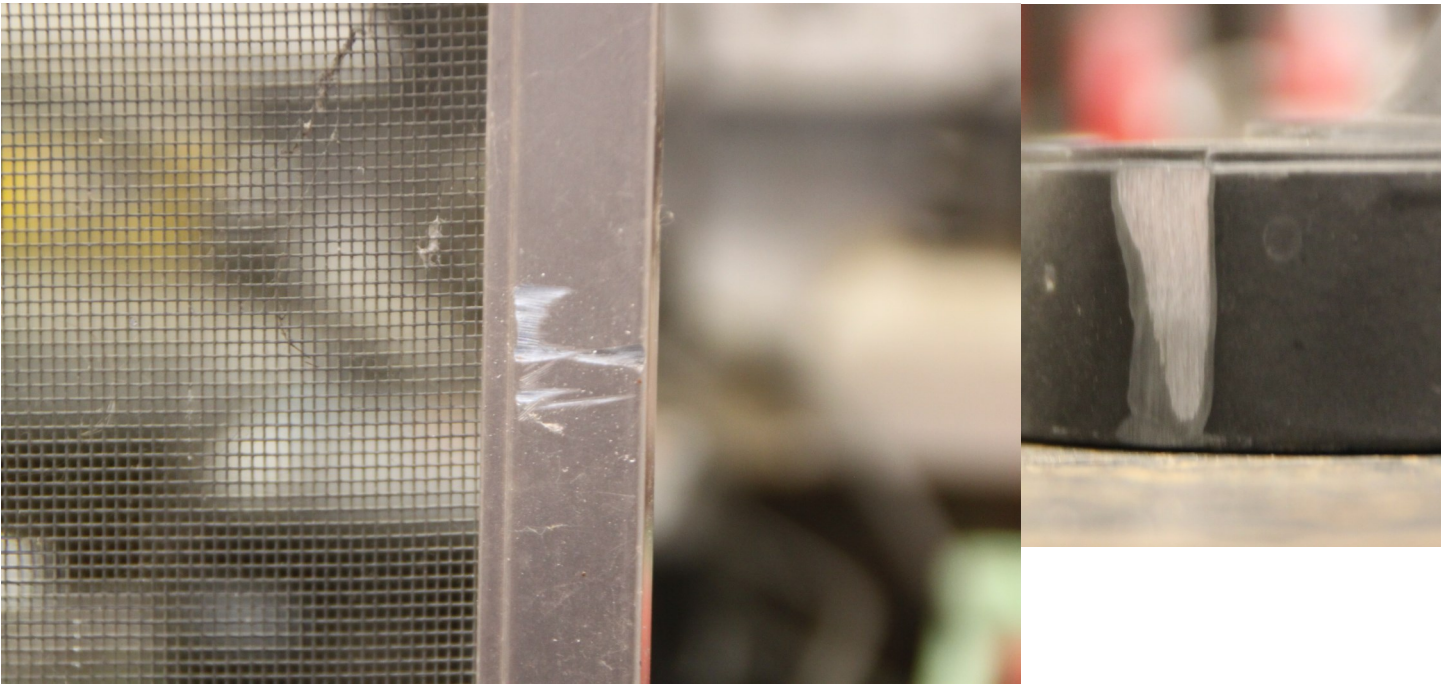
Brass that has been combined with other materials and is too difficult to separate into only brass. Like copper, when it is mixed with other metals, the brass goes into a category known as “BRASS NUMBER 2.”

Common items you will see:

- Faucet
- Plumbing and gas fittings
- Door knobs

Sorting Brass (2) Checklist:

- **MAKE SURE THERE IS MOSTLY BRASS**—ensure there is more brass than the other elements before placing the metal into the bin.
- **SEPARATE MOST OF THE OTHER MATERIALS FROM THE BRASS**—remove as much of the other materials as possible to get the most value out of the brass.
- **PLACE THE METAL IN THE BIN LABELLED “BRASS#2”**



ALUMINUM

Aluminum is a soft, lightweight non-ferrous metal and has many common uses in commercial construction. For example, aluminum is an excellent conductor of heating and electricity conduits. It is also used to construct window and door frames because of its energy-saving benefits.

Common items you will see:

- Door and Window Frames
- Household Appliances
- Electronics

Sorting Aluminum Checklist:

- **MAKE SURE IT IS ALUMINUM**—Use a magnet or a file to ensure it is aluminum and not another alloy.
- **DO NOT USE A GRINDER ON ALUMINUM**— grinding can send aluminum dust into the air, which can be inhaled and cause many long-term health issues.
- **SEPARATE THE OTHER MATERIALS FROM THE ALUMINUM**—remove all other materials to get the most value from the aluminum.
- **PLACE IN THE BIN LABELLED “ALUMINUM”**



CAST ALUMINUM

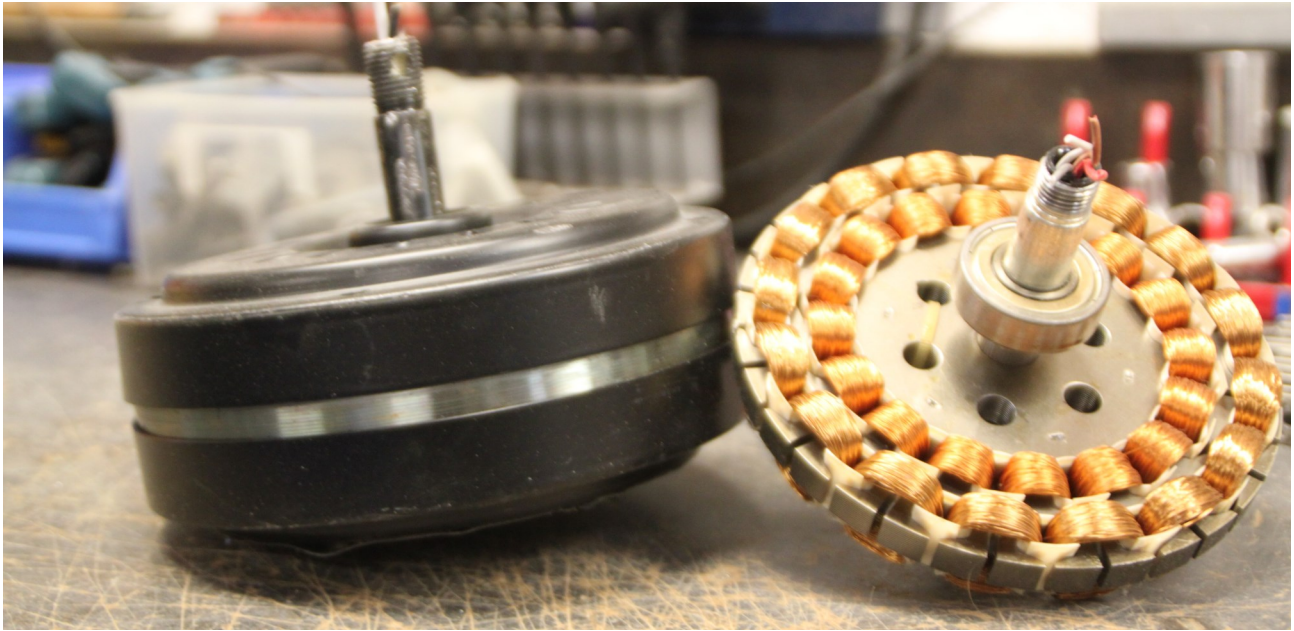
Aluminum that has been superheated and moulded to shape various products. It is used to make patio furniture and exterior lights because of its durability and strength.

Common items you will see:

- Exterior lights
- Outdoor/patio furniture
- Cookware

Sorting Cast Aluminum Checklist:

- **MAKE SURE IT IS CAST ALUMINUM**—use a magnet or file to ensure the metal is, in fact, cast aluminum.
- **DO NOT USE A GRINDER ON ALUMINUM**—like regular aluminum, grinding cast aluminum will send dust into the air, which can be inhaled and cause many long-term health issues.
- **SEPARATE THE OTHER MATERIALS FROM THE ALUMINUM**—remove all other materials to get the most value from the aluminum.
- **PLACE IN THE BIN LABELLED “CAST ALUMINUM”**



ELECTRICAL MOTORS

Electrical motors are devices found in power tools and appliances donated at the Restore. Motors must be removed from their appliances to be processed and appropriately recycled.

Motors and appliances with Electrical Motors:

- Ceiling Fans
- Power Tools (drills, saws, sanders, ext.)
- Hood Ranges
- Sump Pumps

Sorting Electrical Motors Checklist:

- **REMOVE MOTOR FROM ITS ENCLOSURE**—the motor must be removed from the appliance or tool. It should only be the motor and, if from a ceiling fan, its steel base.
- **CUT OFF ALL THE WIRES COMING FROM THE MOTOR**—any electrical cables and wires hanging out of the motor should be removed.
- **PLACE THE MOTOR IN THE BIN LABELLED “MOTORS”**



NON-FERROUS METALS

Metals that DO NOT contain traces of iron. They are **non-magnetic** and have much greater value than ferrous metals. Some non-ferrous metals include tin, zinc and lead. Copper, aluminum and brass are also considered non-ferrous, although they are sorted into another category.

Common items:

- Cabinet handles
- Some Electronics
- Some power tools

Sorting Non-ferrous Checklist:

- **MAKE SURE IT IS NON-FERROUS METAL**— use a magnet or grind the surface away to ensure it is a non-ferrous metal.
- **SEPARATE THE OTHER MATERIALS FROM THE NON-FERROUS METAL** - remove other materials from this metal using the tools at hand.
- **PLACE IN THE BIN LABELLED “NON-FERROUS”**

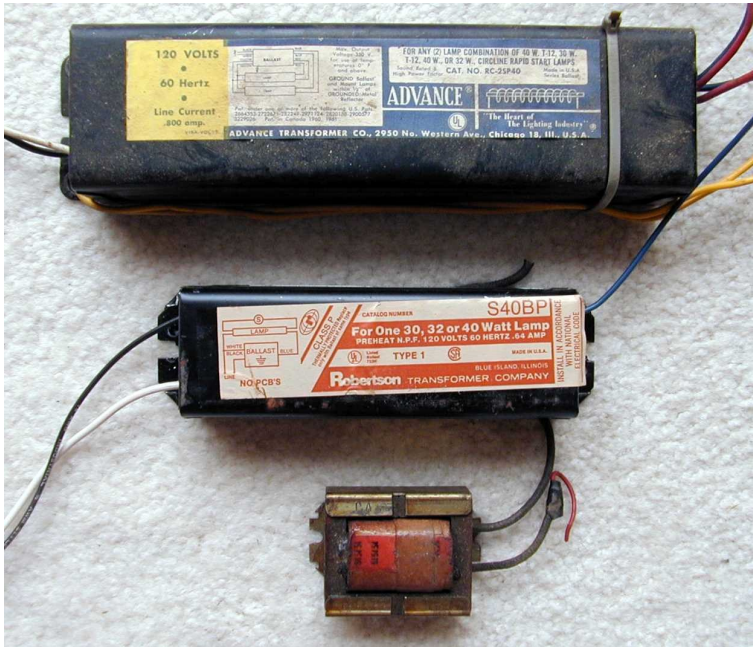


STAINLESS STEEL SINKS

If a stainless steel sink is damaged or defective in some manner and the Restore is unable to resell it, it is then marked as scrap metal and has to be recycled. However, stainless steel, like copper or brass, has its own category in our scrap metal program and should be appropriately processed.

Processing Stainless Steel Sinks:

- **REMOVE ANY OTHER MATERIALS FROM THE STAINLESS STEEL SINK**—other materials might be attached to the sink, like faucets and mounting brackets. These items should be removed before the sink is recycled.
- **BRING THE SINK TO THE WAREHOUSE**—take the stainless steel sink to an area established as the “Stainless Steel Sink Drop-off” by the Restore staff. For the Cambridge Restore, sinks go in the warehouse area next to the scrap metal recycling bins (next to the loading dock).



Retrieved from https://en.wikipedia.org/wiki/Electrical_ballast



Retrieved from <https://www.bulbs.com/product/B234SR120M-A000I>

FLUORESCENT/ELECTRONIC BALLASTS

Fluorescent and electronic ballasts regulate the power going into a fluorescent and LED light. These devices must be removed and disposed of properly when recycled for scrap metal.

Common lights that use ballasts:

- Lighting with fluorescent tubes
- Integrated LED light fixtures

Recycling a Fluorescent/Electronic Ballast Checklist:

- **FOR YOUR SAFETY, WEAR GLOVES BEFORE HANDLING ANY LIGHTING BALLAST**—some (older) fluorescent ballasts are oil-based and contain what is known as PCB (Polychlorinated biphenyls), which is a highly toxic chemical. For your safety, wear gloves when handling any ballasts from any fixtures.
- **REMOVE FROM FIXTURE**—remove any screws holding the ballast in place and cut any electrical cables before recycling the ballast.
- **PLACE BALLAST IN AN ENCLOSED CONTAINER**—ensure the container you place the ballast in is enclosed or sealed along the bottom and on all sides.



FERROUS METALS/SHRED METAL

Metals in this category contain traces of iron. The traces of iron make these metals **magnetic** and carry less value than precious metals.

Common Ferrous Items and Devices:

- Interior Lights
- Household Appliances
- Fireplaces
- Water Heaters
- Building Materials (screws, door hinges, polls, ext.)
- Some Furniture

How to Sort Ferrous Metals:

- **REMOVE ALL OTHER METALS**—Ferrous (magnetic) metals do not require a lot of processing. Remove as much of the non-ferrous metals as possible and sort accordingly. Some materials like plastic and ceramic sockets can remain with the metal.
- **PUT FERROUS METAL IN A LARGE RECYCLING BIN**



Incandescent



Fluorescent



LED

LIGHT BULBS

Three types of lightbulbs are donated at the Restore: **incandescent** (or halogen and quartz), **fluorescent** and **LED**. Follow the steps below if any of these bulbs are damaged or defective and should be recycled:

- **Incandescent Bulbs**: these bulbs have little to no harmful materials and can go in the garbage.
- **Fluorescent Bulbs**: these bulbs contain harmful materials like mercury and fibreglass. Within your establishment, there are designated recycling containers for fluorescent bulbs.

For the Waterloo Restore, the container is located in the **Receiving Area next to the Electronic Recycling Bins**.

- **LED bulbs**: these types of bulbs contain circuitry and other electronic components. However, most LED bulbs **do not** go into electronics recycling. Instead, any LED bulbs should go into a designated recycling container.

For the Cambridge Restore, the container is located in the **Warehouse Area next to the loading dock**.



Thermostats



Smoke Detectors



Mercury

THERMOSTATS AND SMOKE DETECTORS

Thermostats and Smoke Detectors contain mercury. **Mercury is a hazardous material that can cause severe health and environmental damage if not handled or disposed of properly.** Therefore, any devices containing mercury should not go into the Landfill.

PROCESSING THERMOSTATS AND SMOKE DETECTORS

Wear gloves when handling any smoke detector or thermostat. Locate and dispose of these devices in the bin (or bins) marked for “thermostat” and “smoke detector” recycling.

For the Cambridge Restore, the recycling bins are located in the **Warehouse Area next to the loading dock.**

References

- Britannica, T. Editors of Encyclopaedia (Invalid Date). copper. Encyclopedia Britannica. <https://www.britannica.com/science/copper>
- Britannica, T. Editors of Encyclopaedia (Invalid Date). brass. Encyclopedia Britannica. <https://www.britannica.com/technology/brass-alloy>
- The Difference Between Ferrous & Non-Ferrous Metals | Eclipse Magnetics.* (n.d.). <https://www.eclipsemagnetics.com/resources/the-difference-between-ferrous-and-non-ferrous-metals/>
- Weinhandl, D. (2021, July 20). *Common Uses for Brass.* Mead Metals, Inc. <https://www.meadmetals.com/blog/common-uses-for-brass>
- Britannica, T. Editors of Encyclopaedia (Invalid Date). aluminum. Encyclopedia Britannica. <https://www.britannica.com/science/aluminum>
- Coderman, J. N.-. (2021, September 13). *Top 10 Uses of Aluminium in the Industry Today - Materials and Engineering Resources - Matmatch.* Materials and Engineering Resources - Matmatch - Get the Latest in Materials Science and Engineering News, Educational Content and Material Use Cases. <https://matmatch.com/resources/blog/top-10-uses-of-aluminium-in-the-industry-today/>
- Aluminum Toxicity | Winchester Hospital.* (n.d.). <https://www.winchesterhospital.org/health-library/article?id=164929>
- Hodson, A. (2021, November 9). *The Advantages of Using Cast Aluminum.* The Federal Group USA. <https://www.tfgusa.com/cast-aluminum-advantages/>
- Tatum, M. (2022, October 25). *What is Cast Aluminum?* Home Questions Answered. <https://www.homequestionsanswered.com/what-is-cast-aluminum.htm>
- The Difference Between Ferrous & Non-Ferrous Metals | Eclipse Magnetics.* (n.d.-b). <https://www.eclipsemagnetics.com/resources/the-difference-between-ferrous-and-non-ferrous-metals/>
- Romex cable.* Wiring Examples and Instructions. (n.d.). Retrieved November 29, 2022, from <https://www.how-to-wire-it.com/romex-cable.html>
- Diversion, W. (n.d.). *Waste Diversion - PCB Ballast Disposal.* Waste Diversion. https://www.waste-diversion.ca/pcb-ballasts.php?gclid=Cj0KCQiAm5ycBhCXARIsAPldzoW1fCnc6Lf3ZYTmhja_TT8qTdIOS2s9wzpbObBsIZrmeosU0OqQPSUaApmuEALw_wcB
- Lighting, R. (2016, July 18). *What is a ballast?* YouTube. <https://www.youtube.com/watch?v=FUILfaghyw8&feature=youtu.be>
- Holden, B. (2022, February 25). *How to Use Pocket Change to Determine Wire Sizes .* Retrieved from Family Handyman: <https://www.familyhandyman.com/article/how-to-use-pocket-change-to-determine-wire-sizes/>