

HOW ARE BATTERIES RECYCLED?



The recycling process is a little different for each battery material type, but the following is a typical chain of events:

1. First, batteries are sorted into their respective material types.

- This includes lithium ion, lead acid, nickel cadmium, etc. – they are all processed via different processes!

2. Batteries are discharged of their energy to neutralize any remaining charge they may hold.

- This can occur a number of different ways – submersion in an electrolyte brine, manual electrical discharge, and others.

3. Discharged batteries are put through a shredder to break their materials down so they can be mechanically split up into several types.

- The main materials involved are plastics, copper/aluminum foils, electrolyte, and a mixture of leftovers called “black Mass”.
- “Black Mass” is a dark, sandy-textured mixture that contains the materials from cathodes and diodes – the “meat” of the battery, and usually where the most important materials are! Lithium, cobalt, nickel, and more.

4. The “Black Mass” of mixed materials is then chemically treated to isolate each type of substance.

- In most cases, this occurs either by heat-based reaction processes (*called “pyrometallurgy”*), or fluid-based reaction processes (*called “hydrometallurgy”*).

5. The now-isolated, purified substances are then ready to be upcycled back into the supply chain for reuse!

- The battery recycling process involves bringing materials down to a molecular level, so unlike plastics, paper, and most other recyclables, recycled cathode/diode materials don’t denature over time – they can be reused indefinitely!