HOW ARE BATTERIES RECYCLED?

Lead Acid Batteries

The lead acid batteries are broken down in a hammer mill—a machine that breaks them into pieces. The pieces are then placed in a large tank, where the lead and heavy metals fall to the bottom and the plastic floats. At this point, the plastic pieces are removed, and liquids are drawn out, leaving the lead and heavy metals. Each of the materials go to different recycling streams.

- The plastic goes to a plastic recycler where the pieces are melted to an almost-liquid state. The molten plastic is put through a specialized machine that produces small plastic pellets. These pellets are sold to the manufacturers of battery cases and put back into the recycling chain.
- Lead is heated, cleaned, and poured into ingot molds. When the ingots cool, they are removed from the molds and sold to the battery manufacturers, where they are re-melted and used for the production of batteries.
- Sulfuric acid is processed and converted to sodium sulfate—a white powder used in laundry detergents, glass, and textile manufacturing.

Alkaline-Zinc, Carbon-Zinc, Air Batteries

These batteries are recycled using a specialized mechanical separation process whereby battery components are separated in 3 end products: zinc & manganese concentrate; steel; paper and plastic. The end products are put back into the market; these batteries are 100% recycled.

Lithium Batteries

The contents of the batteries are exposed using a shredder or a high-speed hammer depending on the battery size. The contents are then submerged in caustic water to neutralize the electrolytes. Ferrous and non-ferrous metals are recovered. The clean scrap is then sold to metal recyclers. The rest solution is filtered and any remaining carbon is recovered. The lithium in the solution is converted to lithium carbonate—a fine white powder. What results is technical grade lithium which is used to make lithium ingot and foil for batteries.

Nickel-Cadmium, Nickel Metal Hydride Batteries

Prior to the smelting process, plastics are separated from the metal components. The metals are then recycled via High Temperature Metal Reclamation (HTMR) process during which all the high temperature metals (nickel, iron, manganese, and chromium) contained within the battery are fed into a furnace. Molten metals combine and solidify. The metals and plastics are reused. These batteries are 100% recycled.

Mercury Batteries

Mercury batteries must be handled with great care and recycled through controlled-temperature due to the high toxicity of the heavy metals they contain. Hydro- and Pyro-metallurgical recycling processes are conducted in a highly- controlled material extraction environment. Eliminated mercury is reused for manufacturing new mercury-based batteries, in dental amalgams, in metric instruments, and in fluorescent lighting.

Button Cell, Silver-Oxide Batteries

Silver-oxide batteries are shredded during the recycling process to recover valuable heavy metals. Silver-oxide batteries are the button cell batteries used in watches. Once the used battery is removed, the mercury content has to be extracted under vacuum conditions leaving a silver steel residue. The silver content is further extracted to determine a precious metal value.