

By Chaz Miller

# Lead-Acid Batteries

Lead-acid batteries have the highest recycling rate in the United States.

A BATTERY IS A DEVICE in which the energy of a chemical reaction can be converted into electricity. Small, sealed button and six-volt batteries are used for consumer products; “starting batteries” deliver a short burst of high power to start engines; “deep-cycle batteries” deliver a low, steady level of power for electrical accessories such as trolling motors on boats; and large industrial batteries have thicker plates and can supply low steady power for years. This profile is limited to lead-acid batteries used by motor vehicles.

A lead-acid battery consists of a polypropylene casing; lead terminals and positive and negative internal plates; lead oxide; electrolyte, a dilute solution of sulfuric acid and water; and plastic separators made of a porous synthetic material. More than 80 percent of the lead produced in America is used in lead-acid batteries.

Lead-acid batteries have the highest recycling rate of any product sold in the United States. This is because of the ease of returning a used battery when purchasing a new battery and the value of the lead and plastic components of the used battery.

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## Lead-Acid Battery Municipal Solid Waste Facts:

### Generated:

- 2.29 million tons or 1.0% by weight.\*
- 15.75 pounds (lbs.) per person.\*
- The average life of a car battery is four years.
- The average life of a truck battery is three years.
- The amount of lead in a car battery is 21.4 lbs.

### Landfill Volume:

- Negligible.

### Density

- Average car battery weighs 39 lbs.
- Average truck battery weighs 53 lbs.
- Average motorcycle battery weighs 9.5 lbs.

### Source-Reduction:

- In 10 years, car battery cycles have increased from 2500 to 6000.
- Industrial batteries can last 10 to 20 years.

### Recycling Markets:

- Polypropylene casings processed back into new battery casings.
- Lead is recycled into lead plates and other battery parts.
- Battery acid is either neutralized, treated and discharged into sewers or processed into sodium sulfate, a powder used in laundry detergent, glass and textile manufacturing.

### Recycled:

- 2.13 million tons or 93%.\*
- 97% of battery lead is recycled (industry data).
- Nine states have battery deposit laws.
- Most states require retailers to collect old lead-acid batteries from customers who buy new batteries.

### Recycled Content:

- A typical battery has 60% to 80% recycled lead and plastic.

### Composted:

- Lead-acid batteries should never be placed in a composting pile.

### Incinerated or Landfilled:

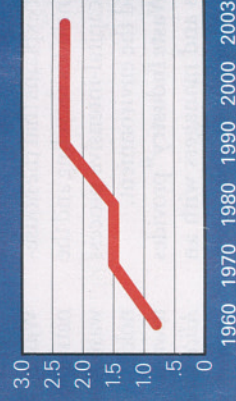
- 160,000 tons or 0.1% by weight.\*
- Should not be incinerated.
- 41 states ban disposal in Subtitle D landfills.

### Sources:

Battery Council International, [www.batterycouncil.org](http://www.batterycouncil.org)  
 “Measurement Standards and Reporting Guidelines”, National Recycling Coalition, Washington, D.C., [www.nrc-recycle.org](http://www.nrc-recycle.org)  
 “Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2003”, U.S. EPA, 2005, [www.epa.gov/osw](http://www.epa.gov/osw)  
 Waste Age, “If They Ban It, Will It Go Away?” October 1993  
 \*EPA estimates for 2003

## Lead-Acid Battery Tonnage and Recycling Rate

Lead-Acid Battery Tonnage\*



Lead-Acid Battery Recycling Rate\*

