

EPA Sustainable Materials Management Web Academy



**Management challenges for
lithium batteries at electronics
recyclers**

April 5, 2018

<https://www.epa.gov/smm/sustainable-materials-management-web-academy>

Our Speakers:



Craig Boswell,
HOBI
International



Neil Peters-Michaud,
Cascade Asset
Management



Chris Coady,
The Recycling
Partnership



**George
Kerchner,**
The
Rechargeable
Battery
Association
(PRBA)



Kevin Leary,
U.S. Department
of Transportation



Disclaimer

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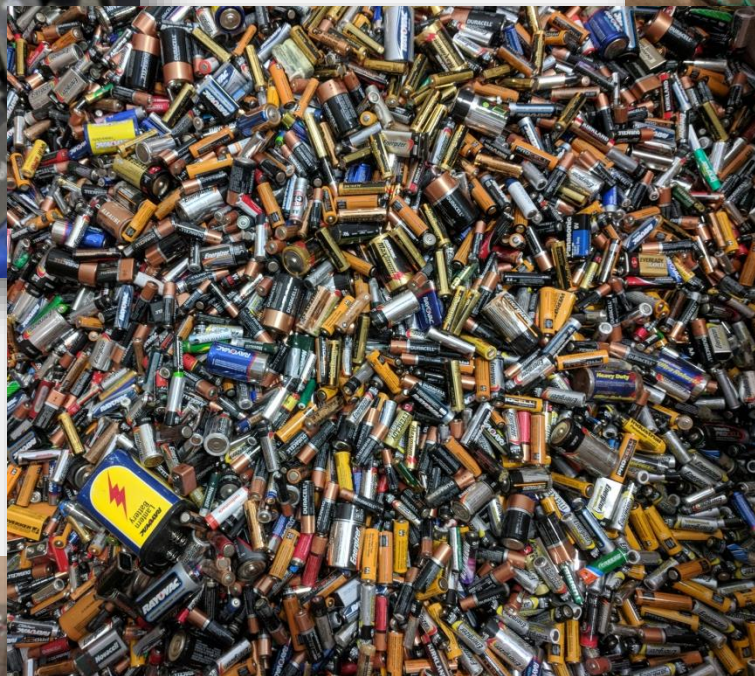
**George
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Batteries from Electronics



Photos from Cascade
Asset Management
2018

Removing battery from iPhone 6

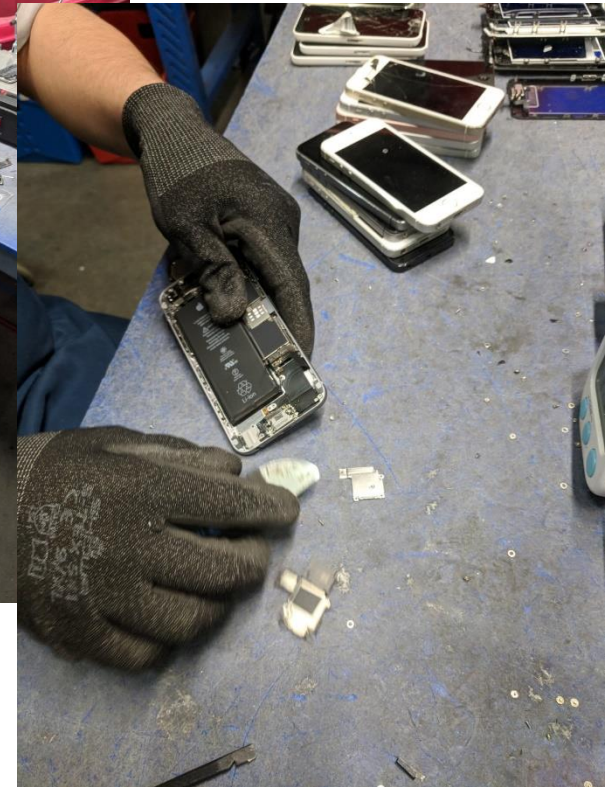
These Li-ion Polymer batteries are glued into the aluminum case of the iPhone 6. The batteries are thin (about 2 mm thick) and are difficult to remove without bending and causing a reaction.

Cascade's process to remove batteries is to first disassemble the case to remove all electronics from the base, leaving just the battery and the backplate of the case.



Disassembling the smart phone

There are dozens of tiny screws holding the electronics into the case. These are removed using an inline drill driver and other special tools (suction cups remove the glass initially).



Melting glue

Once the electronics are removed, the case and battery are put on a low-temperature hot table for 4 minutes at ~95 degrees Fahrenheit. This melts the adhesive without damaging the battery. Typically, up to 6 phones can be heated at one time.



Peeling off the battery

A thin plastic tool is used to gently pry to battery from the case, once the glue is melted. This still takes some delicate hands to make sure the battery is not punctured or bent.

The battery is removed from the case. Some of the glue can still be seen on the case.



Taping batteries

Removed batteries are taped so that their contacts are not exposed. This limits the possibility of discharge and causing a reaction.

These taped batteries are bulk shipped to a downstream recycler and labeled per DOT restrictions.

Cascade staff who handle batteries must successfully complete the DOT Security Awareness Training as per 49 CFR 172.704(a)(4) to ensure batteries are packaged properly and in conformance with DOT requirements.

Cascade's emergency contact info and the UN ID that corresponds to the battery chemistry (United Nations Committee of Experts on the Transport of Dangerous Goods) is on each box.



LITHIUM BATTERIES –
FORBIDDEN FOR TRANSPORT
ABOARD AIRCRAFT AND
VESSEL

UN 3480 –
LITHIUM-ION BATTERIES

Shipped by:
Cascade Asset Management
6701 Manufacturers Drive
Madison, WI 53704



608-222-4800



UN3480

Lithium Ion Batteries

61.0
135

In case of fire . . .

By all of our battery handling areas, we have a container with sand and a lid that can be used to contain the fire or reaction, if one occurs. There are tongs at each station to grab the battery and place it into this bin. The bin with the battery is then taken outside to isolate the battery from the rest of our inventory.



When fire happens

iPad battery fire. This Li-ion Polymer battery started reacting when a hard cased battery landed on it in our tub that accumulates the batteries handled for the day.

Another fire incident occurred when a glued battery was punctured when it was being scraped off from its case.

Since Cascade disassembles and recycled batteries from tens of thousands of devices each year, the fire incident rate is very low but the potential for harm is significant.



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 Rethink

Have a question about transporting hazardous materials?

Need clarification on an entry in the Hazardous Materials Regulations?

PHMSA's Hazmat Information Center provides live, one-on-one assistance, M-F, 9 AM-5 PM ET

Department of Transportation Hazardous Materials Information Center

1-800-HMR-4922 (1-800-467-4922)

202-366-4488

infocntr@dot.gov

Call the Info Center:

- for help with use of the [Hazardous Materials Regulations](#) (49 CFR Parts 100-185);
- for information concerning hazardous materials transportation and rulemakings;
- to report violations of the HMR;
- to receive recent copies of Federal Register publications or DOT special permits;
- to request copies of training materials;
- to request a formal [letter of interpretation](#).

Additional information:

<https://www.phmsa.dot.gov/lithiumbatteries>

<https://www.phmsa.dot.gov/about-phmsa/offices/office-hazardous-materials-safety>



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Questions on Li battery issues?

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(703) 308-3948

Our next webinar:

April 19, 2018

Deconstruction and Building Materials Reuse: Innovations and Opportunities

