
BATTERIES IN EVERYTHING!

MINIMIZING LEGAL RISKS RELATED TO LI-ION
BATTERY HANDLING, RECYCLING, AND DISPOSAL

Midwest Environmental Compliance Conference

September 24, 2024



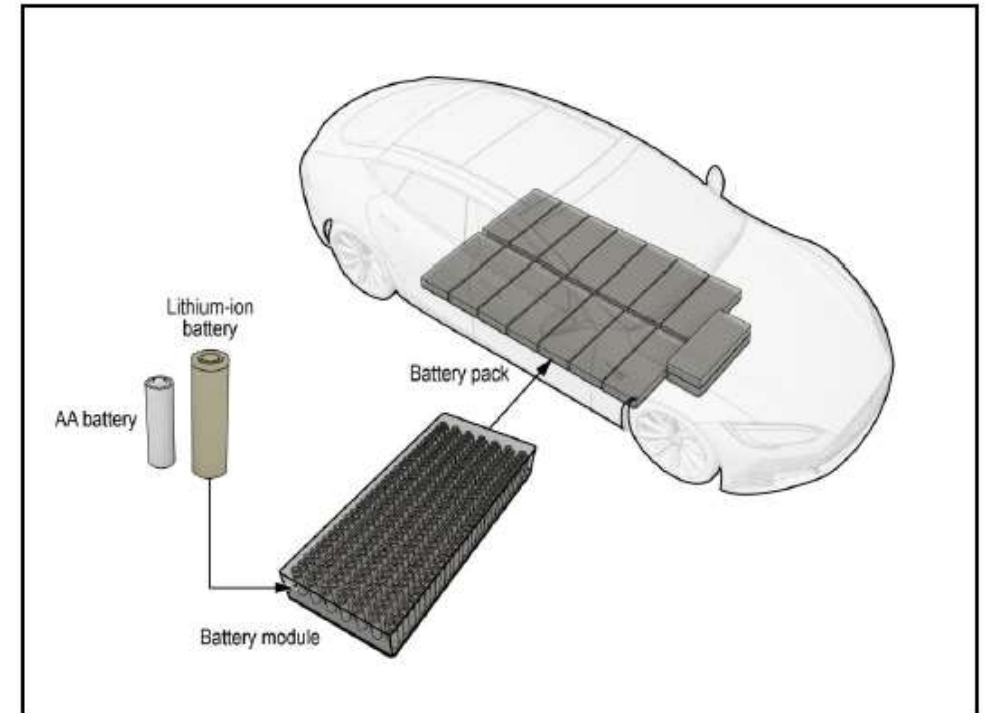
BRIEF HISTORY OF LI-ION BATTERY DEVELOPMENT

- Lithium was discovered as part of petalite ore in the early 1800s and isolated in 1821
- The oil crisis of the 1970s spurred development, including an attempt by Exxon to commercialize a form of Li-Ion battery in the mid-1970s
- Three scientists pioneered discoveries that are credited with creating the modern rechargeable Li-Ion battery:
 - Stanley Whittingham, John B. Goodenough, Akira Yoshino
 - Awarded the Nobel Prize for Chemistry in 2019
- Sony Corporation produced and sold the first rechargeable Li-Ion battery in 1991



LITHIUM-ION BATTERIES

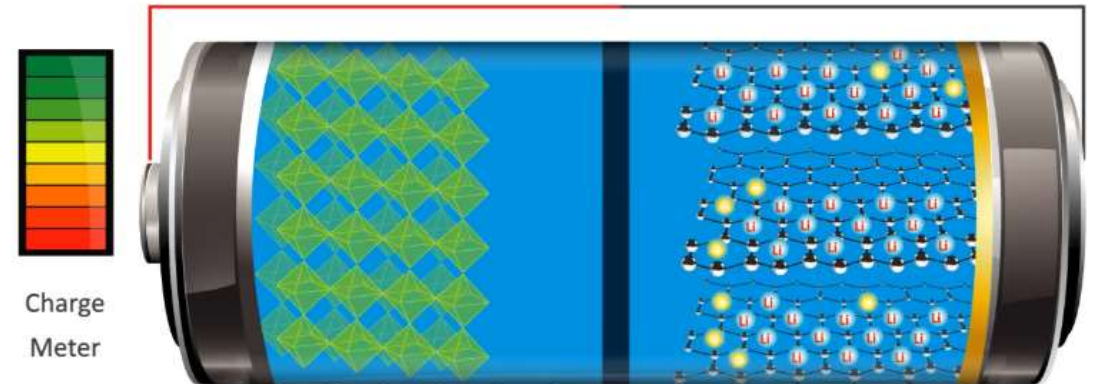
- Rechargeable battery made of one or more cells
- “Battery” can refer to a cell, module, or pack
- Ubiquitous – EVs, smartphones, consumer electronics



LITHIUM-ION BATTERIES

- Made up of **anode (-)**, **cathode (+)**, separator, **electrolyte**, and positive and negative current collectors
 - Anode - typically graphite or similar carbon compound
 - Cathode - typically lithium cobalt oxide
 - The liquid electrolyte carries charged lithium ions between the anode and cathode through the separator
 - Movement of the ions creates a charge

Discharge



U.S. DEPARTMENT OF
ENERGY | Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY

SAFETY & ENVIRONMENTAL ISSUES

■ Interrelated risks

1. Fires
2. Explosions/Thermal runaway
3. Health and environmental impacts from fires and explosions
4. End of life recycling and disposal issues

■ Contributors

1. Internal short circuit that leads to heating and ignition
2. Flammable electrolyte
3. External damage

■ Common Causes

1. Overcharging
2. Extreme temperatures and physical damage

UL Standards & Engagement

Press Release — April 10, 2024

New Report Highlights Safety Risks of Lithium-Ion Batteries in Aviation

Passengers' lack of awareness resulting in increased risk — and incidents — on board

Where do passengers store their lithium-ion batteries?

Checked Luggage	
27%	E-Cigarette
27%	Portable Charger
15%	Laptop
15%	Tablet
3%	Smartphone

DAMAGED, DEFECTIVE, RECALLED (DDR)



Swelling, relative to the same battery in its original state (Fig. 2)

Pictured: a swollen pouch cell battery, placed on top of an undamaged battery for comparison.

- **Damaged / Defective**
 - Acute hazards: gas, fire, visibly leaking electrolyte
 - Swelling
 - Discoloration of battery casing
 - Smell
 - Corrosion
 - Loose or damaged wires
 - Known conditions of use or misuse (i.e., water exposure)
- Pose a greater fire and thermal runaway risk

REGULATORY FRAMEWORK

■ US DOT

- Hazardous Materials Regulations
- 49 C.F.R. part 173

■ US EPA

- RCRA Hazardous Waste Regulations
- Universal Waste under 40 C.F.R. part 273

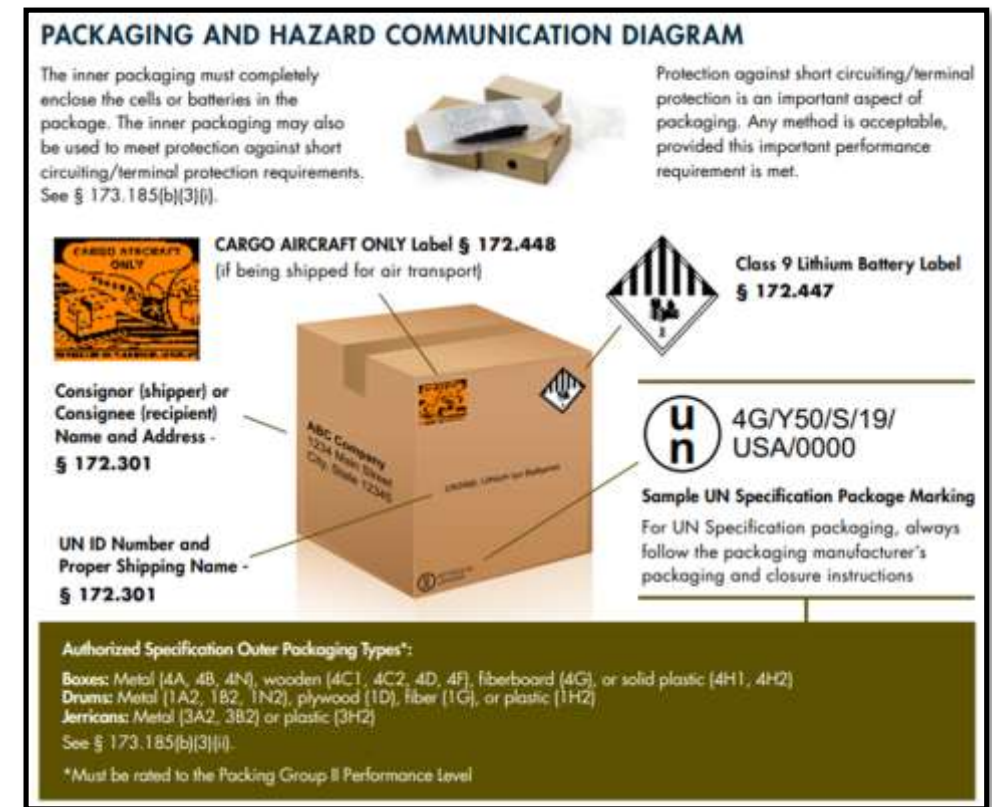
■ State Regulations and Initiatives

- State universal waste regulations
- Storage and Extended Producer Responsibility Laws (“EPR”)



FEDERAL REGULATIONS – DOT HAZARDOUS MATERIALS REGULATIONS – 49 CFR PARTS 171-180

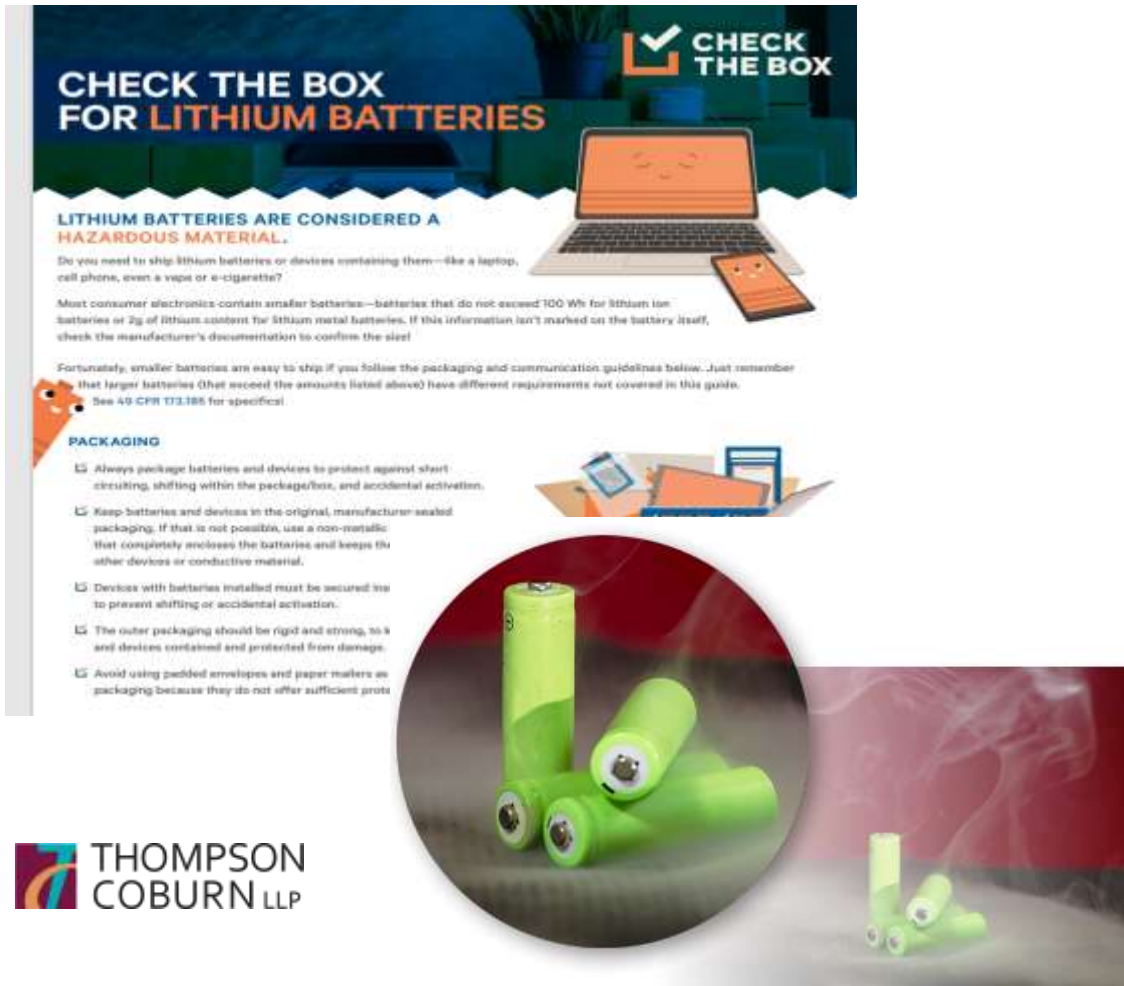
- Lithium cells and batteries – §173.185
 - Packaged to prevent short circuits and damage:
 - Completely enclosed in non-metallic inner packaging
 - When enclosed in equipment, packaged to prevent accidental operation during transport
 - Exceptions for smaller cells (>20 Wh) and batteries (>100 Wh)
- Labeling requirements – §172.447
- Hazmat employee training - §172.704



FEDERAL REGULATIONS – DOT (CONT.)

- Limited exceptions to testing and packaging specification requirements if transported by motor vehicle for disposal or recycling – 49 CFR §173.185(d)
- Specific requirements if DDR –§173.185(f)
 - Cannot be transported by aircraft
 - Packaging:
 - Individual, non-metallic inner packaging that completely encloses the cell or battery
 - Non-combustible, non-conductive, and absorbent cushioning material
 - Individually placed in appropriate outer packaging (Packing Group I performance level)
 - Marked with “damaged/defective lithium-ion battery”
 - No exceptions from training, marking, or labeling requirements

DOT CHECK THE BOX CAMPAIGN



CHECK THE BOX FOR LITHIUM BATTERIES

✓ CHECK THE BOX

LITHIUM BATTERIES ARE CONSIDERED A HAZARDOUS MATERIAL.

Do you need to ship lithium batteries or devices containing them—like a laptop, cell phone, even a vape or e-cigarette?

Most consumer electronics contain smaller batteries—batteries that do not exceed 100 Wh for lithium ion batteries or 2g of lithium content for lithium metal batteries. If this information isn't marked on the battery itself, check the manufacturer's documentation to confirm the size!

Fortunately, smaller batteries are easy to ship if you follow the packaging and communication guidelines below. Just remember that larger batteries (that exceed the amounts listed above) have different requirements not covered in this guide. See 49 CFR 173.185 for specifics!

PACKAGING

- Always package batteries and devices to protect against short-circuiting, shifting within the package/box, and accidental activation.
- Keep batteries and devices in the original, manufacturer-sealed packaging. If that is not possible, use a non-metallic that completely encloses the batteries and keeps them away from other devices or conductive material.
- Devices with batteries installed must be secured in a way to prevent shifting or accidental activation.
- The outer packaging should be rigid and strong, so it can contain and protect the batteries and devices from damage.
- Avoid using padded envelopes and paper mailers as packaging because they do not offer sufficient protection.

THOMPSON COBURN LLP

- [Are Lithium Batteries in your package? | US Department of Transportation](#)
- [Safety Advisory Notice for the Transportation of Lithium Batteries for Disposal or Recycling | PHMSA \(dot.gov\)](#)
- [Understanding the Risks of Damaged, Defective, or Recalled \(DDR\) Lithium Batteries | PHMSA \(dot.gov\)](#)

FEDERAL REGULATIONS - EPA

- Regulated at the end of life
- Most of the regulatory focus is on recycling, not disposal
- Recovery of critical minerals is paramount
 - aluminum, lithium, nickel, cobalt, manganese, and graphite
- **No EPA regulation on reuse or repurposing**
 - Not a waste



Source: U.S. Department of Energy Vehicle Technologies Office.

FEDERAL REGULATIONS - EPA



- Why are Li-Ion batteries hazardous waste under RCRA?
 - Ignitable (D001)
 - Reactive (D003)
- Must be managed as hazardous wastes or universal wastes
- Best approach is to manage as universal waste under 40 C.F.R. Part 273
 - Streamlines requirements for generators and handlers
 - Does not apply if casing is breached, rendering battery DDR
 - Once a battery has arrived at a TSD facility or hazardous waste recycler, it stops being universal waste and becomes fully regulated hazardous waste

FEDERAL REGULATIONS – EPA, CONT.

- Managing Li-ion batteries as universal waste
 - Handlers may sort batteries by type, mix battery types in a single container, discharge batteries, regenerate used batteries, disassemble batteries or battery packs, remove batteries from products, or remove electrolyte from batteries (40 CFR §273.31, 273.33(2))
 - Any waste generated from these activities (including electrolyte) must be assessed for hazardous waste characteristics
 - Recycling activities can only be undertaken by permitted destination facilities
 - Transporting does not require manifesting under RCRA, but does trigger DOT requirements

STATE REGULATIONS – USED BATTERY STORAGE

- Illinois – 2024 amendment to Environmental Protection Act
 - Battery storage sites at which 5,000 kg or more of used EV batteries are stored at any one time must:
 - Register with IEPA prior to February 2026
 - Maintain records documenting weight of volume of used batteries received, shipped away, and remaining at the site each week
 - Directs IEPA to propose and IPCB to adopt rules for battery storage sites, specifically end-of-life battery receipt, handling, storage, and transfer; standards for fire prevention; requirements for contingency planning and emergency response; recordkeeping, reporting



STATE REGULATIONS – EPR LAWS

- Extended Producer Responsibility (EPR) laws – California, New York
 - Place recycling responsibility on manufacturers
 - Require battery producers to participate in stewardship programs for collection and recycling
 - CA EPR law (not yet in effect)
 - Battery producers must create or fund stewardship programs for collecting and recycling batteries no later than April 2027
 - Retailers must charge a fee at point of sale for products with embedded batteries beginning January 2026; fees will pay for state e-waste recycling program
 - Beginning July 2027, manufacturers must notify retailers of covered products and report estimated number of covered products sold during the previous year
- Iowa EPR law only applies to Ni-Cd and sealed lead batteries

LITIGATION LANDSCAPE

■ Improper Disposal

- *Banks County Georgia v. SK Battery America, Inc.*, No. 24-cv-00138 (N.D. Ga.)
 - Suit by county alleging Li-ion battery manufacturer shipped mixed waste, including Li-ion batteries, to a facility not permitted to receive explosive waste, causing a large industrial fire
 - Remanded to state court Aug. 2024

■ Product Liability

- *Altobelli, et al., v. General Motors LLC*, No. 20-cv-13256 (E.D. Mich.)
 - Consolidated class action claiming that GM sold vehicles with defective batteries that caused fires and vehicle overheating
 - \$150 million settlement approved summer 2024

LITIGATION LANDSCAPE - ENFORCEMENT

Rhode Island *Current*

EDUCATION ENERGY + ENVIRONMENT HEALTH CARE TRANSPORTATION POLITICS + JUSTICE ELECTION 2024

ENERGY + ENVIRONMENT HEALTH CARE

R.I. Superior Court judge shuts down Providence scrapyards pending fire prevention review

Temporary restraining order comes on heels of second blaze in three months at Rhode Island Recycled Metals

By: NANCY LAVIN - JULY 12, 2024 5:16 PM



Office of the New York State Attorney General
Letitia James

New York State Attorney General

About | Resources | Libraries & Documents | News & Media | Contact

Search ag.ny.gov

How can we help you?

I Want To...

Home | Press Releases | CONSUMER ALERT: Attorney General James Provides Tips To Protect New Yorkers From E-Bike Battery Fires

Consumer Alert:

CONSUMER ALERT: Attorney General James Provides Tips to Protect New Yorkers from E-Bike Battery Fires

LOCAL NEWS

Illinois Attorney General Sues Superior Battery Over Lithium Battery Fire That Forced Evacuations In Morris

CBS NEWS CHICAGO

August 24, 2021 / 10:02 PM CDT / CBS Chicago



 THOMPSON
COBURN LLP

KEYS TO MINIMIZING LEGAL RISK

- Know the sources of Li-Ion batteries in your operation
- Consult DOT Resources before shipping
- Incorporate Li-Ion batteries into universal waste program (or start one for your batteries)
- Work with an experienced recycler
- Manage DDR batteries appropriately and with caution
- Update fire prevention and response plans to address Li-ion batteries
- Check your insurance



CHICAGO



DALLAS



LOS ANGELES



NEW YORK



Ryan R. Kemper

Partner & Co-Chair Environmental
Thompson Coburn LLP, One US Bank Plaza, St. Louis, Missouri 63101
rkemper@thompsoncoburn.com

314 552 6321 direct
314 602 6321 mobile



SOUTHERN ILLINOIS



ST. LOUIS



WASHINGTON, D.C.



BIRMINGHAM