SAN DIEGO
HAZARDOUS INCIDENT RESPONSE TEAM

STANDARD OPERATING GUIDELINES

Fire Damaged or Reacting Lithium-ion Battery Management-Mobility/Small Devices

	ITEM	DESCRIPTION
☐	**FIRST REPONDER GUIDANCE**	Phone guidance for Fire personnel: In turnouts/SCBA and with proper gloves remove LIB devices to an outside area away from ignition sources and monitor temperature. Consider placing in rigid container with water to prevent thermal runaway. Presume any vapors are toxic and/or flammable. Do not seal container. If battery can be determined something other than Lithium Ion battery it can be packaged appropriately, neutralized if needed, and left to cool. Give guidance for disposal of such battery such as HHW or recyclers such as www.call2recycle.org. The following guidance document is intended for smaller equipment with Lithium ion batteries such as scooters, bikes and other similar size items. If battery heated but did not catch fire, consider allowing battery to cool (preferably in metal container) and follow the procedures for non-burned batteries.
☐	**INITIAL SIZE UP**	▪ Identify if batteries are reacting or involved in a fire ▪ Obtain Emergency Response Plan and facility contact information. If possible, have a facility representative available for IC. Review Emergency Response Plan. ▪ If batteries are reacting but no fire is observed, explosive atmosphere is likely present ▪ Only approach building if explosive gases have been vented or mitigated ▪ Use 4-gas or combustible gas indicators to percentage in air. CO sensor is cross sensitive to H2 ▪ Don proper PPE- Fire Turnouts with SCBA for suppression, overhaul, mitigation ▪ Avoid contact with gasses generated from reacting battery
☐	**CHEMICAL INFORMATION (if available)**	▪ UN 3480 or 3481 DOT 9 Dangerous Goods ▪ Lithium Ferrous Phosphate ▪ Lithium Nickel Manganese Cobalt Oxide or similar ▪ Non LIB- Lead Acid, Zinc Bromide, Other if present in addition to LIBs
☐	**PROTECTIVE MEASURES**	ERG Guide 147 ▪ Initial 75’ for fire at LIB with no LIB impact. ▪ LIB impact- ISOLATE for 500 meters (1/3 mile) in all directions; also, consider initial evacuations for 500 meters (1/3 mile) ▪ Consider wind direction changes
☐	**TACTICAL ACTIONS**	▪ Don proper PPE- Fire Turnouts with SCBA for suppression, overhaul, mitigation. Other PPE to be considered as needed, such as high temperature gloves or gloves to shield from battery charges. ▪ Guidance for on scene responders should include relocation of impacted batteries from inside of a structure to outside area away from combustibles, if safe to do so. Use TIC. ▪ Prepare monitoring equipment- TIC for reaction temps, 4-gas with CO and CGI for H2/flamm, pH paper, Fl paper for HF. For smoke consider also RAE for Cl2 vapors, RAE or Draeger for HCl vapors

		▪ Other Equipment needed- Battery removal tools, Bucket/Drum, Salt and water ▪ Take photos of the battery condition. Place the battery in the NaCl water away from combustibles. This process results in electrical discharge and multiple batteries in contact can result in re-ignition. Think of this as a neutralization operation and conduct additional monitoring as needed. ▪ Keep lid ajar or bung open and place in safe area away from combustibles and ignition sources. ▪ DO NOT SEAL LID TIGHT until the reaction is determined complete, AND the batteries are removed from the solution for recycling or disposal. Hydrogen/ gases needs to vent during de-energizing. ▪ Monitor temperature with TIC, mark date/time and temp on the container. Let battery sit for minimum 24 hours, per EPA recommended time is 3 days to 3 months. ▪ Smoke, steam, bubbles or detection of flammable vapor (H2) readings can indicate that the battery is still reacting. H2 is cross sensitive to Carbon Monoxide sensor and often results in CO alarm. ▪ Determine safe location for battery(s) to remain secured away from combustibles and ignition sources. If no safe location is available on site consider use of Hazardous Waste Transporter variance for legal transport to offsite location. The waste accumulation site should be a unified program permitted facility. A temporary site could include a facility such as a landfill or bomb range where there is ample space and area is controlled. ▪ Provide responsible party with hauler list and provide disposal guidance. ▪ For residential related incidents, after incident stabilization, buckets with batteries will be remain in possession of the responsible party for disposal with safe handling instructions and recommended website links for disposal assistance. If determined not safe to remain on site by IC/Hazmat Captain and DEHQ (no responsible party, no suitable location for overnight storage, concern over tampering with waste, any other public safety concern), the waste may need to be transported to an offsite location for continued monitoring and disposal. Refer to ERT, Hazardous waste variance and DOT transport requirements.
☐	**MITIGATION AND CONTAINMENT**	▪ Place batteries in a container of water in an isolated area. Ensure container is covered but do not seal lid. Ensure storage location is free from combustible material. Battery may need to be stored for up to 3 weeks at the location. ▪ Rapid Discharge: If rapid discharge of energy is required based on the incident, a 5% salt solution can be used. ▪ Mix Solid salt (e.g. Morton's) into container for approximately 5% NaCl s solution: ▪ 1.5 pounds to 3-4 gallons of water in 5 gallon bucket, fill to 3" from top after battery submersion. ▪ 12.5 pound salt bag for 25 gallons water (leave space for batteries in 30 gallon drum) ▪ 25 pound bags for 50 gallons water. ▪ The quantity of batteries and concentration of salt determine how long this reaction can continue upon immersion to de-energize. If possible, Disconnect the battery and Remove the battery from the equipment/device.
☐	**Disposal Guidance**	▪ The EPA and State DTSC normally consider Lithium Ion batteries a Universal Waste, however a fire can change the recyclability of batteries. After battery no longer poses a fire hazard and when ready for disposal, do the following: ▪ At Residence: Provide resident contact information for their local Household Hazardous Waste program to determine requirements for acceptance. Provide guidance to ensure safety during transportation (background temperature, Properly sealed container for waste with liquids, lid ajar if transporting solids only). Let them know that if HHW does not take it, they will need to contact a private hazardous waste hauler, may want to talk to their insurance provider. Provide list of HHW contacts and registered Haulers/recyclers list. ▪ Do not ever completely seal a lid onto the container of saltwater with LIBs. The batteries must be removed from the solution (or liquid drained from container) before a lid can be fully sealed tight for an extended period, for transport to a recycler or disposal facility.

		▪ At Business: Provide business the hazardous waste haulers list and provide proper disposal guidance. Refer to DEHQ for follow-up. The business can be offered DEHQ test data for waste saltwater solution to assist with their waste determination. Testing conducted September 2022 indicated trace amounts of only copper, well below regulatory limits, pH not exceeding 9.2 and aquatic toxicity at >4800 mg/L. Fluoride salts were also below limits. The saltwater solution after one month was not a hazardous waste. Some pH testing has shown that near pH 12 can occur depending on how long the batteries are in salt solution.
☐	**ADDITIONAL RESOURCES**	▪ Fire ▪ EMS ▪ DTSC ▪ EPA
☐	**TECHNICAL REFERENCES**	▪ ERG Book or App ▪ CAMEO/ALOHA/Marplot & EPA AEGLs ▪ PEAC ▪ NIOSH/CalOSHA – for IDLH and/or PELs ▪ Safer Mobile ▪ CERES ▪ WISER
☐	**PERSONAL PROTECTIVE EQUIPMENT**	▪ Turnouts with SCBA
☐	**MONITORING & DETECTION**	▪ CGI – LEL can be compared to CO sensor. CO not maxing with LEL indicates non H2 flams ▪ Thermal Imaging Camera – above 250F may indicate thermal runaway/propagation potential ▪ Explor IR – carbonates/carbonic esters indicate battery electrolyte vapors. ▪ PID – An air sample can be captured for later use on GasMet to assist decon/exposures ▪ Area Raes – Remove H2S sensor if HCN used. VOC an indicator of failing batteries. ▪ pH paper – Acid or Base can indicate failed batteries ▪ HF paper – Instructions say to use HCl, however these can be wetted with water if worn on PPE
☐	**Off Site Storage**	▪ Batteries taken off site during immediate response for safety reasons ▪ Check the temperature with TIC. Mark date/time and temp on container. ▪ When waste is at ambient temperature and ready for disposal, pH the saltwater. ▪ Contact hazardous waste hauler or battery recycler, provide photos and documentation on temperature/pH. ▪ If waste hauler/recycler cannot accept batteries in water, verify pH is between 5 and 12.5. If you find the pH is rapidly increasing during the response you might want to add a weak acid (citric or vinegar) to buffer the pH. The waste is sewerable pending no EPA regulated heavy metals present (consult DEHQ). Previous sample results by EPA and DEHQ have determined this is not a corrosive waste or toxic waste due to heavy metals or aquatic toxicity. ▪ Take photos and send documentation information to your recycler/hauler for disposal/recycling. ▪ The hauler/recycler may require the batteries be placed into specific containment for transport, metal container with liner and cell block. You may have to separate the batteries from the liquid. ▪ City of San Diego Storage Yard: 2730 Murphy Canyon Rd San Diego ▪ Lock Code: 1255
☐	**DECONTAMINATION**	▪ Launder turnouts following NFPA 1851 Standards ▪ Liquid CO2 for heavily soiled turnouts (inside structure or in smoke plume) ▪ Disposal at expense of Responsible Party should be considered.
☐	**INCIDENT TERMINATION**	▪ Batteries are no longer reacting. TIC shows stable or decreasing temperatures. ▪ Enforcement ▪ ICS forms ▪ Inspection forms

Other Resources for Lithium Ion Battery Information and Guidance:

Vehicle Fires IAFC response considerations

IAFC ESS Recommendations

USDOT PHMSA: https://www.phmsa.dot.gov/lithiumbatteries

EPA: https://www.epa.gov/recycle/used-lithium-ion-batteries

Tesla: https://www.tesla.com/firstresponders

FEMA US Fire Administration: https://www.usfa.fema.gov/blog/ig-042822.html

FDNY Tactics & more: https://www.nyc.gov/site/fdny/codes/reference/lithium-ion-battery-safety.page

LA Fire Considerations: EPA Analysis of lithium-ion-battery-fires

EPA: 

EPA Analysis of lithium-ion-battery-fi

CUPA Battery Reporting: 

upaag-battery-reporting-guidance-for-upa

CA Fire Codes: https://up.codes/s/storage-of-lithium-ion-and-lithium-metal-batteries

Consumer Guidance: https://www.epa.gov/recycle/used-lithium-ion-batteries

SOG- Fire Damaged or Reacting Lithium ion Battery Management-Mobility/Small Devices

Refer to Departmental SOGs for suppression and extermination of fire.

Consideration shall be given to allow batteries to burn out while protecting nearby structures.

Phone guidance for Fire personnel: In turnouts/SCBA and with proper gloves remove LIB devices to an outside area away from ignition sources and monitor temperature. Consider placing in rigid container with water to prevent thermal runaway. Presume any vapors are toxic and/or flammable. Do not seal container

If battery can be determined something other than Lithium Ion battery it can be packaged appropriately, neutralized if needed, and left to cool. Give guidance for disposal of such battery such as HHW or recyclers such as www.call2recycle.org. The following guidance document is intended for smaller equipment with Lithium ion batteries such as scooters, bikes and other similar size items. **If battery heated but did not catch fire, consider allowing battery to cool (preferably in metal container) without the use of the procedures below**.

Incident considerations for lithium ion batteries should include the following:

1. Don proper PPE- Fire Turnouts with SCBA for suppression. Other PPE to be considered as needed, such as high temperature gloves or gloves to shield from battery charges.
2. Guidance for on scene responders should include relocation of impacted batteries from inside of a structure to outside area away from combustibles, if safe to do so. Use TIC.
3. Prepare monitoring equipment- TIC for reaction temps, 4-gas with CO and CGI for H2/flamm, pH paper, Fl paper for HF. For smoke consider also RAE for Cl2 vapors, RAE or Draeger for HCl vapors
4. Other Equipment needed- Battery removal tools, Bucket/Drum, Salt and water
5. Rapid Discharge: Mix Solid salt (e.g. Morton's) into container for approximately 20% NaCl s solution:
   - **6 pounds to 3-4 gallons of water in 5 gallon bucket, fill to 3" from top after battery submersion.**
   - **50 pound salt bag for 25 gallons water (leave space for batteries in 30 gallon drum)**

   2 x 50 pound bags for 50 gallons water.
   The quantity of batteries and concentration of salt determine how long this reaction can continue upon immersion to de-energize. If possible, Disconnect the battery and Remove the battery from the equipment/device.
6. Take photos of the battery condition. Place the battery in the NaCl water away from combustibles. This process results in electrical discharge and multiple batteries in contact can result in re-ignition. Think of this as a neutralization operation and conduct additional monitoring as needed.
   Keep **lid ajar** or bung open and place in safe area away from combustibles and ignition sources.
   DO NOT SEAL LID TIGHT until the reaction is determined complete, AND the batteries are removed from the solution for recycling or disposal. Hydrogen/ gases needs to vent during de-energizing.
7. Monitor temperature with TIC, mark date/time and temp on the container. Let battery sit for minimum 24 hours, per EPA recommended time is 3 days to 3 months.
8. **Smoke, steam, bubbles or detection of flammable vapor (H2) readings can indicate that the battery is still reacting**. H2 is cross sensitive to Carbon Monoxide sensor and often results in CO alarm.
9. Determine safe location for battery(s) to remain secured away from combustibles and ignition sources. If no safe location is available on site consider use of Hazardous Waste Transporter variance for legal transport to offsite location. The waste accumulation site should be a unified program permitted facility. A temporary site could include a facility such as a landfill or bomb range where there is ample space and area is controlled.
10. Provide responsible party with hauler list and provide disposal guidance.

For residential related incidents, after incident stabilization, buckets with batteries will be remain in possession of the responsible party for disposal with safe handling instructions and recommended website links for disposal assistance. **If determined not safe to remain on site by IC/Hazmat Captain and DEHQ (no responsible party, no suitable location for overnight storage, concern over tampering with waste, any other public safety concern),** the waste may need to be transported to an offsite location for continued monitoring and disposal. ***Refer to ERT, Hazardous waste variance and DOT transport requirements***.

When there is no RP or for County of San Diego properties DEHQ has Battery Solutions cell block and metal drums for damaged lithium batteries. There is one small container (3 gallon) and there are two larger ½ drum size containers at the garage.

Waste Management procedures for Lithium Ion batteries.

The EPA and State DTSC normally consider Lithium Ion batteries a Universal Waste, however a fire can change the recyclability of batteries. After battery no longer poses a fire hazard and when ready for disposal, do the following:

At Residence: Provide resident contact information for their local Household Hazardous Waste program to determine requirements for acceptance. Provide guidance to ensure safety during transportation (background temperature, Properly sealed container for waste with liquids, lid ajar if transporting solids only). Let them know that if HHW does not take it, they will need to contact a private hazardous waste hauler, may want to talk to their insurance provider. Provide list of HHW contacts and registered Haulers/recyclers list.

Do not ever completely seal a lid onto the container of saltwater with LIBs. The batteries must be removed from the solution (or liquid drained from container) before a lid can be fully sealed tight for an extended period, for transport to a recycler or disposal facility.

At Business: Provide business the hazardous waste haulers list and provide proper disposal guidance. Refer to DEHQ for follow-up. The business can be offered DEHQ test data for waste saltwater solution to assist with their waste determination. Testing conducted September 2022 indicated trace amounts of only copper, well below regulatory limits, pH not exceeding 9.2 and aquatic toxicity at >4800 mg/L. Fluoride salts were also below limits. The saltwater solution after one month was not a hazardous waste. Some pH testing has shown that near pH 12 can occur depending on how long the batteries are in salt solution.

Batteries taken off site during immediate response for safety reasons:

1) Check the temperature with TIC. Mark date/time and temp on container.
2) When waste is at ambient temperature and ready for disposal, pH the saltwater.
3) Contact hazardous waste hauler or battery recycler, provide photos and documentation on temperature/pH.
4) If waste hauler/recycler cannot accept batteries in water, verify pH is between 5 and 12.5. If you find the pH is rapidly increasing during the response you might want to add a weak acid (citric or vinegar) to buffer the pH. The waste is sewerable pending no EPA regulated heavy metals present (consult DEHQ). Previous sample results by EPA and DEHQ have determined this is not a corrosive waste or toxic waste due to heavy metals or aquatic toxicity.
5) Take photos and send documentation information to your recycler/hauler for disposal/recycling.
6) The hauler/recycler may require the batteries be placed into specific containment for transport, metal container with liner and cell block. You may have to separate the batteries from the liquid.

IAFC Guidance for Vehicle Battery Fires that can be applied to other Lithium ion battery device fires: Use a thermal imaging camera to ensure that the high voltage battery is completely cooled before leaving the incident. The battery must be monitored for at least one hour after it is found to be completely cooled. **Smoke or steam indicates that the battery is still heating**. IAFC recommends Do not release the vehicle to second responders, such as law enforcement and towing personnel, until there has been no heating detected for one hour.

Other Resources for Lithium Ion Battery Information and Guidance:

Vehicle Fires IAFC response considerations

IAFC ESS Recommendations

USDOT PHMSA: https://www.phmsa.dot.gov/lithiumbatteries

EPA: https://www.epa.gov/recycle/used-lithium-ion-batteries

Tesla: https://www.tesla.com/firstresponders

FEMA US Fire Administration: https://www.usfa.fema.gov/blog/ig-042822.html

FDNY Tactics & more: https://www.nyc.gov/site/fdny/codes/reference/lithium-ion-battery-safety.page

LA Fire Considerations: EPA Analysis of lithium-ion-battery-fires

EPA: EPA Analysis of lithium-ion-battery-fi

CUPA Battery Reporting: upaag-battery-reporting-guidance-for-upa

CA Fire Codes: https://up.codes/s/storage-of-lithium-ion-and-lithium-metal-batteries

Consumer Guidance: https://www.epa.gov/recycle/used-lithium-ion-batteries

Lithium-Ion Battery Disposal for Consumers

EPA recommendation: Find a location to recycle Li-ion batteries and products that contain Li-ion batteries using one of the suggested links; do not put them in the trash or municipal recycling bins.

Li-ion batteries in electronics: Send electronic devices containing Li-ion batteries to certified electronics recyclers, participating retailers and recyclers in electronics takeback services or contact your local solid waste or household hazardous waste collection program for more options.

Li-ion batteries that are easily separated from the product (e.g., power tools): Find a recycling location near you to properly dispose of Li-ion batteries. Send individual batteries to specialized battery recyclers or retailers that are participating in takeback services or contact your local solid waste or household hazardous waste program for more options.

Two resources for finding a recycler are the Earth 911 database and Call2Recycle.

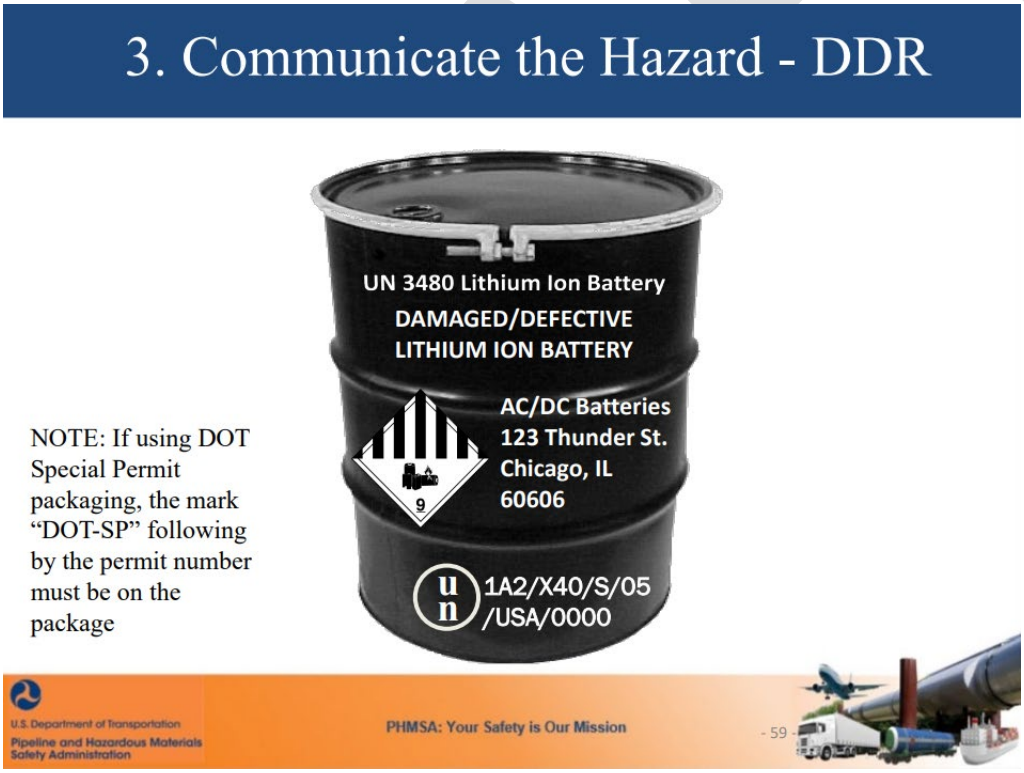
Handling precautions: Place each battery or device containing a battery in a separate plastic bag. Place non-conductive tape (e.g., electrical tape) over the battery's terminals. If the Li-ion battery becomes damaged, contact the battery or device manufacturer for specific handling information. Even used batteries can have enough energy to injure or start fires. Not all batteries are removable or serviceable by the user. Heed battery and product markings regarding safety and use.

<u>Due to DOT requirements the waste recycler/transporter may require the following:</u>

1.) Classify the Hazard.
Determine if Lithium Ion
(recyclable) or Lithium Metal
(disposable).

2.) Contain the Hazard-
Place the cell or battery in an individual
non-metallic packaging that completely
encloses the battery or cell, such as a
bag or drum liner of sufficient thickness to
lift the battery without tearing the
liner. One battery/cell per packaging.
Surrounding the inner packaging
with cushioning material that is non-
combustible, electrically non- conductive,
and absorbent such as placing Cell Block
into a HW drum. Some haulers may
prefer an inner poly drum be used, then
that drum into a larger metal drum.

3.) Communicate the Hazard: For EPA-DOT compliance for management of a waste battery, use Universal or Hazardous Waste label.



EPA recommends using the Universal Waste label during accumulation. Your Hazardous Waste hauler may determine the waste will be disposed and a Hazardous Waste label required, see next page for sample HW label

Here are some examples of proper labeling for transport of batteries:

Guide 1: UN3480 Proper Shipping Name: Lithium Ion Batteries. Hazard Class Label: Class 9 Lithium Battery

Guide 2: UN3480 Proper Shipping Name: Lithium ion batteries Hazard Class Label: N/A

Guide 3: UN3481 Proper Shipping Name: Lithium ion batteries packed with or contained in equipment Hazard Class Label: Class 9 Lithium Battery

Guide 4: UN3481 Proper Shipping Name: Lithium ion batteries packed with or contained in equipment Hazard Class Label: N/A

Guide 5: Proper Shipping Name: Lithium metal batteries Hazard Class Label: Class 9 Lithium Battery

Guide 6: Proper Shipping Name: Lithium metal batteries Hazard Class Label: Class 9 Lithium Battery

Guide 7: Proper Shipping Name: Lithium metal batteries packed with or contained in equipment Hazard Class Label: Class 9 Lithium Battery

Guide 8: Proper Shipping Name: Lithium metal batteries packed with or contained in equipment Hazard Class Label: N/A

Guide 9: Proper Shipping Name: Battery-powered vehicle Hazard Class Label: Class 9 Miscellaneous

Guide 10: Proper Shipping Name: Lithium batteries installed in cargo transport unit lithium ion batteries or lithium metal batteries Hazard Class Label: N/A (see Required Hazard Communication for additional details)


HAZARDOUS WASTE

STATE & FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL.

GENERATOR INFORMATION:

NAME City of San Diego Fire Department

ADDRESS 9366 Friars Road PHONE

CITY San Diego STATE CA ZIP 92108

EPA ID NO. / MANIFEST TRACKING NO. /

EPA WASTE NO. CA WASTE NO. ACCUMULATION START DATE

CONTENTS, COMPOSITION: Damaged Lithium Ion Battery

PHYSICAL STATE: ☒ SOLID ☐ LIQUID

HAZARDOUS PROPERTIES: ☐ FLAMMABLE ☐ TOXIC ☐ CORROSIVE ☐ REACTIVITY ☒ OTHER

D.O.T. PROPER SHIPPING NAME UN 3480, Lithium Ion Batteries

UN OR NA NO.

HANDLE WITH CARE!

CONTAINS HAZARDOUS OR TOXIC WASTES

Additional Information for Battery Transportation

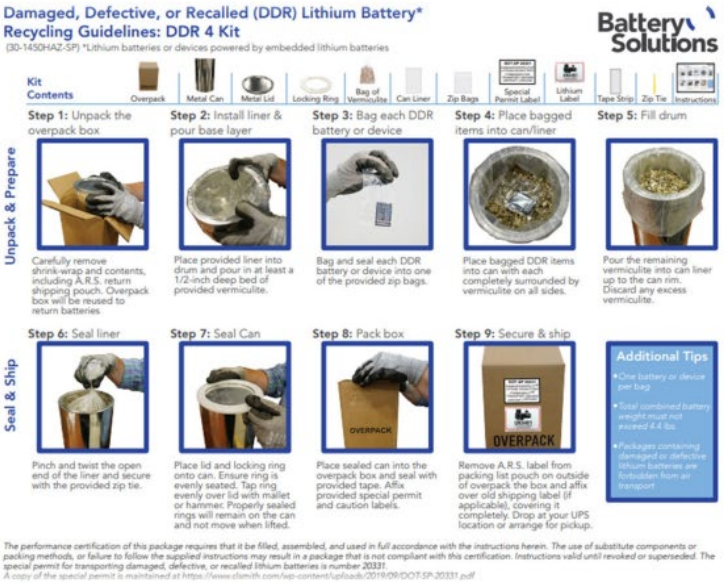
DOT HMR Requirements apply to most Lithium or Lithium ion batteries, exceptions for DDR sent for recycling and small batteries. Lithium Battery Guide numbers 1-10 for labeling require you know if battery is Lithium Ion (reusable) or Lithium Metal (disposable), whether or not the battery is still contained within equipment or removed from equipment and the size. Size is determined only by energy storage capabilities and is measured in Watt Hours for Lithium Ion batteries and in Grams for Lithium metal batteries.

Special Permits for Shipping Lithium Batteries: Some recyclers have Kits for DDR batteries that meet these requirements.

PHMSA has issued special permits for packaging designs meant to handle damaged, defective, or recalled batteries. A special permit allows a person to deviate from specific HMR requirements while maintaining an equivalent level of safety. A person applying for a special permit must demonstrate that the requested special permit achieves a level of safety at least equal to that required by the regulatory provision from which they seek a deviation [see § 107.105(d)]. A person who holds a special permit must comply with the special permit's requirements. The outside of each package authorized by a special permit is marked "DOTSP" followed by the special permit number assigned. Anyone can search for the special permit number on the PHMSA special permits search page using the special permit number.

DDR Kits

Disclaimer: images are examples of DOT Special Permit packaging and not an endorsement of any particular product or company



Pictured: DOT-SP 20331

Packages containing lithium batteries must have proper hazard communication. In general, packages containing lithium batteries shipped in accordance with the HMR require the Class 9 lithium battery label as found in § 172.447 and depicted in Figure 1.

Figure 1. Class 9 Lithium Battery Label

Training:

HAZMAT Training Requirements:

Who needs HAZMAT training?

The HMR impose training requirements that are generally applicable to any employee who prepares, packages, offers, or transports lithium batteries for recycling or disposal [see §§ 172.700 through 172.704]. Training requirements may not be applicable to shippers and carriers transporting qualifying shipments of “smaller” lithium batteries in accordance with § 173.185(c). 10

Which HAZMAT training is necessary?

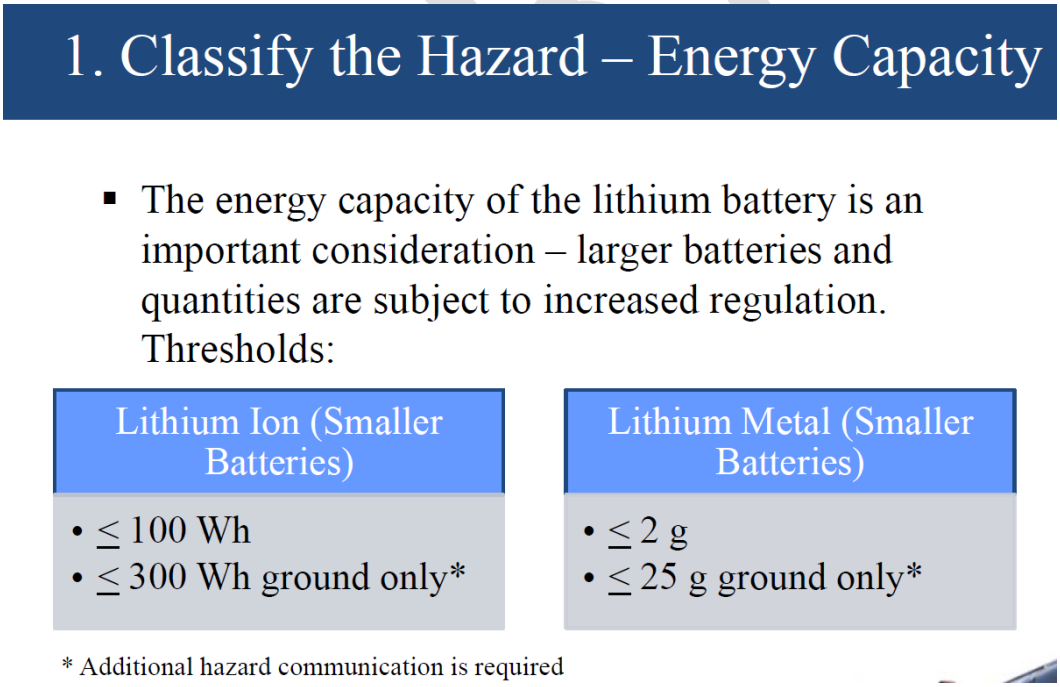
HAZMAT training [§ 172.704(a)] includes the following components: • General awareness/familiarization. • Function-specific training. • Safety. • Security awareness. A training program from another Federal or state agency that includes these four HAZMAT components can fulfill the HMR training requirements [§ 172.704(a)]. More information on training requirements is available from the PHMSA website: https://www.phmsa.dot.gov/training/hazmat/training-requirements-industry.

Who is responsible for providing training?

Each entity that employs individuals who prepare, package, offer, or transport lithium batteries is responsible for: • Providing training for its employees who prepare, package, offer, or transport lithium batteries (hazmat employees). • Testing its hazmat employees. • Certifying its hazmat employees’ training. • Developing, maintaining, and retaining its hazmat employees’ training records. o Records must be kept for each hazmat employee for the following time frames: Three years from the date of the last training; and, 90 days after the hazmat employee has left the company.

Excerpts from the EPA-DOT training module:

PDF
april_29_2021_epa_and_dot_speaker_slide



1. Classify the Hazard – Energy Capacity

^ Under 100 Wh and qualifies for "Small" battery exception

- Watt-hour (Wh) = Ampere-hours (Ah) x Volts (V)
- In the case of milliampere hour (mAh), divide by 1000

2. Contain the Hazard – Inner Packaging

2. Contain the Hazard – Cushioning Material

2. Contain the Hazard – "Larger" Batteries and Quantities

Increased Regulation

- Batteries over 300 Wh rating (Lithium Ion) or 25 g (Lithium Metal)
- Packages over 66 lbs gross weight

UN Specification Packaging (ONLY Rail/Vessel)

1A2/X40/S/05
USA/0000

49 CFR § 173.185(b)(3)

3. Communicate the Hazard - Package

Universal Waste Label OR Marking (EPA)

Cargo Aircraft Only Label (DOT)

Lithium Battery Handling Mark (DOT)

49 CFR § 173.185(c)(3) & 40 CFR §§ 273.14, 273.34

Other Resources for Lithium battery emergencies:

https://www.epa.gov/recycle/used-lithium-ion-batteries

https://www.osha.gov/sites/default/files/publications/shib011819.pdf

Lake Parkway Lithium Battery Fire, EPA Region 4 Hazmat Incident presentation

https://www.ehs.washington.edu/system/files/resources/lithium-battery-safety.pdf