

PACKAGING UNIVERSAL WASTE REFERENCE GUIDE

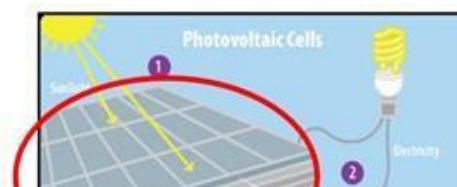


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US DEPT of TRANSPORTATION NEW LITHIUM BATTERY	
RULES November 2021	

INTRODUCTION

It is the intent of this document to provide the users with a Best Management Practices approach to managing, sorting, and packaging of the items that fit the Universal Waste category. It is NOT intended to supersede regulatory requirements. Please always consult with regulations to insure you are using the most current requirements.

SHIPPING AND PACKING GUIDELINES

The following guidelines developed by e-Recycling of California to assist you in preparing your waste for shipment to our facility. Following these guidelines will help ensure that your waste is packaged safely for transit, receipt and allow for efficient handling at our facility. If you have any questions regarding these guidelines, please contact e-Recycling of California.

GENERAL GUIDELINES FOR ALL WASTES

- All containers must be US DOT approved and properly labeled according to US EPA and US DOT regulations.
- All metal containers must include a drum liner. The drum liner must contain all the material inside the drum and be at least 4 mm thick.
- All drummed bulk solutions must be shipped in a closed-head poly or poly-lined steel drum sealed with a bung.
- Follow US DOT weight limits for all containers.
- For lab pack wastes, inside containers must be of good integrity, sealed and not leaking. And absorbent must be used between the inside containers. Vermiculite and Speedi Dry are preferable. Do not use sawdust, corncob, Styrofoam peanuts, or bubble wrap.
- Each inside container must be clearly labeled to indicate the contents.
- Each outside container must be labeled indicating
 - Generator Information
 - ERC Approval Code
 - US DOT Hazard Class
 - Proper US DOT Shipping Name
 - US EPA Waste Code (if applicable)
 - Manifest or BOL Number and Date
 - Container Number
- A new profile is required to be completed if the chemical or physical characteristics of the waste to be shipped change in any way.
- Unknowns, flammables, explosives, compressed gases, radio-actives, prophorics, infectious and medical wastes are not acceptable.

SECTION 1 / LAMP RECYCLING



LAMP TYPES

STRAIGHT FLOURESCENT LAMP

L1

These lamps can vary from under 2 feet to 8+ feet long and will also vary by circumference with a distinguished number to identify the lamp type.



SHATTER-SHIELD LAMP

L1

These lamps will look like the straight fluorescent lamps and will come in similar sizes, but they have a plastic shell or coating on the outside to contain the glass and gas if the lamp is broken. Read the markings on the end of the lamp to determine what lamp it is. Package these lamps separate from regular straight lamps when possible or clearly mark on the container "shatter-shields."



INCANDESCENT LAMP

L2

This lamp is your standard household lamp that has been used for many years. These bulbs will come in various shapes, colors, and sizes. They are also used in cars, small toys, and luminescent air fresheners. Some of the white lamps may have CFL inside and are NOT considered incandescent. Be sure to inspect lamps thoroughly. Refer to CFL section for visual.



U-TUBE LAMP

L2

These lamps are a straight fluorescent lamp that have been shaped like the letter U. They will vary in size.



CFL (COMPACT) LAMPS

L2

Compact Fluorescent Lamps are replacing incandescent bulbs in homes and offices. They have many shapes and can be inside of lamps that look like flood or even incandescent lamps. Note that some of the lamps look like incandescent lamps on the outside but have a CFL inside. Be sure to read the markings on the lamp to determine type.



CIRCULAR LAMP

L2

These lamps are commonly found in closets or restrooms. They are a round or circular fluorescent lamps in different sizes and styles.



HALOGEN QUARTZ LAMP

L3

These lamps are found in ceiling fans, shop lights, desk lamps, reading lamps, head lamps for vehicles, and security lights for homes or buildings. They can vary in shape and size.



HID LAMP

L3

HID stand for High Density Discharge. These lamps can be found in a variety of scientific equipment, warehouse lighting, and parking lot lighting. They have a distinct element or filament that runs through the center of the bulb as noted in the pictures. They are also bulbs used in vehicles.



HIGH PRESSURE SODIUM LAMP

L3

These lamps look like HID and incandescent, but they have a distinct solid core filament running through the center of them.



MERCURY VAPOR LAMP

L3

Some of these lamps will look very similar to HID lamps. There are few that will not have the filament in the center of the lamp and it will be replaced by liquid mercury.



METAL HALIDE LAMP

L3

These lamps will look like the HID and the high-pressure lamps with a distinct filament center.



NEON LAMP

L5

These lamps are typically used as signs for businesses; displayed in windows or outside a storefront. They can also look like a colored straight tube.



LOW PRESSURE SODIUM LAMP

L3

These lamps have a very distinct filament inside of the lamp. On the outside they look like an incandescent. Be sure to read markings on lamp to determine type.



ULTRAVIOLET LAMP

L3 **L1**

UV lamps are found in some tanning beds, water treatment plants, hospitals, and various scientific equipment used to treat or kill bacteria.



GERMICIDAL LAMP

L3

These lamps are used to kill bacteria and to produce ozone for water disinfection. They may be found in various types of scientific equipment. They look like halogen lamps.



ARC LAMP

L3

These lamps will be very distinct in how they look. Note that they have ground wire connected to one end of the lamp.



BROKEN FLUORESCENT LAMPS

L4

Broken lamps must be packaged and contained in specified packaging before transport. See packaging guidelines for details on how safely clean up, contain, and package. Please be sure to not on containers clearly that "Broken Fluorescent Bulbs Are Enclosed."



BROKEN MIXED LAMPS

L4

Broken or crushed lamps must be packaged and contained in specific packaging before transport. See packaging guidelines for details on how to safely clean up, contain, and package. Please be sure to note on containers clearly that “Broken Mixed Bulbs Are Enclosed.”



LAMP PACKAGING GUIDE

PACKAGING 1

4 FOOT OR 8 FOOT BOXES

4 FOOT DRUMS WITH LIDS

L1

Box ends must be taped. Boxes with broken lamps inside must be lined; see **PACKAGING 4** for instructions. Boxes & fiber drums must be kept out of the weather. **DO NOT USE TAPE ON ANY LAMPS.** Please use Universal Waste Label on packaging to identify lamp types. **Do not mix lamps from different categories in packaging, as this will result in higher charges.**



PACKAGING 2

L2

1 GALLON, 5 GALLON OR 10 GALLON PAILS

15 GALLONS TO 55 GALLON POLY DRUMS

(NO METAL DRUMS)

4 FOOT FIBER DRUM

SEALED CARDBOARD BOXES

ALL PAILS AND DRUMS MUST HAVE LIDS

Boxes & fiber drums must be kept out of the weather. Please use Universal Waste Labels on packaging to identify lamp types. **Do not mix lamps from different categories in packaging, as this will result in higher charges.**



PACKAGING 3

Follow guidelines from **PACKAGING 2** and use the same containers.

L3

Lamps must be secured safely within the packaging with Styrofoam or newspapers. Lamps do not need to be individually wrapped. Place Styrofoam or newspaper on top of the lamps to avoid breakage during transportation. **Do not mix lamps from different categories in packaging, as this will result in higher charges.**

PACKAGING 4

L4

**5 GALLON SCREW TOP PAIL
55 GALLON OPEN TOP METAL DRUM**

Use plastic liner or bag inside of pails, drums or boxes before lamps are placed inside. Please use Universal Waste Labels on packaging to identify "Mixed Broken Lamps," or "Fluorescent Broken Lamps."



Please use gloves, eye wear, and dust mask when handling broken lamps. **Do not mix lamps from different categories in packaging, as this will result in higher charges.**

PACKAGING 5

L5

**SEALED CARDBOARD BOX
GAYLORD BOX WITH LID**

Small neon signs can be safely packaged with Styrofoam or newspaper in sealed cardboard boxes. Larger signs can be safely packaged in Gaylord boxes on pallets. If your sign is too large to fit inside of a Gaylord box, special packaging may be needed to be built to hold sign for safe transportation. Boxes must be kept out of weather. Please use Universal Waste Labels on packaging to identify lamp types. **Do not mix lamps from different categories in packaging, as this will result in higher charges.**



UNIVERSAL WASTE LABEL (GENERATOR RESPONSIBILITY)**

Please use a Universal Waste Label on all packaging or containers while stored in your facility to clearly identify the type of waste you are storing and for how long. A Universal Waste Label must be on all packaging or containers prior to pick up.

****Failure to do so may result in fines during Regulatory Inspections.**

Universal Waste	
☐	Universal Waste – CRT(s)
☐	Universal Waste – CRT Glass
☐	Universal Waste – Electronic Devices
☐	Universal Waste – Battery(ies)
☐	Universal Waste – Mercury – Containing Equipment
☐	Universal Waste – Lamp(s)
☐	Universal Waste – _____
☐	Universal Waste – _____
Accumulation Start Date: _____	
HANDLE WITH CARE	

DO:

- Package lamps tightly without separators or any other packaging materials.
 - Place partially filled boxes on top of the pallet.
 - Keep lamps dry.
 - Empty boxes of all packing materials before refilling.
 - Use 42" x 48" pallet for 4-foot lamps.
 - Secure boxes by shrink-wrapping directly to the pallet.
-

DON'T:

- Don't tape lamps together.
 - Don't pack different lengths together.
 - Don't allow lamp boxes to get wet.
 - Don't place debris of any type in the lamp boxes.
-

PROPER PACKAGING OF LAMPS IN FIBER DRUMS



When packaging fluorescent lamps in fiber drum, make sure the lamps are not sticking out of the top of the drum, the lid should fit securely on the drum.

UNIVERSAL WASTE FEDERAL LAW PROHIBITS IMPROPER DISPOSAL THE FOLLOWING MATERIALS ARE REGULATED AS A UNIVERSAL WASTE IN ACCORDANCE WITH 40 CFR PART 273: ☐ UNIVERSAL WASTE - BATTERY ☐ UNIVERSAL WASTE - MERCURY THERMOSTAT(S) ☐ UNIVERSAL WASTE - PESTICIDE(S) ☐ UNIVERSAL WASTE - LAMPS ACCUMULATION START DATE: _____ _____ _____ D.O.T. PROHIBITS SHIPING HAZARDOUS OR ON OR IN NO. 1000, WHITE PAPER (includes or contains fluorescent, waste material, or also regulated by other parts 170-175) HANDLE WITH CARE! State UN09 80001 LABEL MASTER 800 811 6808 www.labelmaster.com

Make sure each drum is identified by a Universal Waste Label, which has the proper D.O.T. shipping name, noting generator and an accumulation date.



When shipping the drums, place drums on a pallet and band together or shrink wrap fiber drums to pallet. Make sure that the labels are visible for the driver. If you have multiple generators, also make sure that their material is separated in different drums and have been labeled to ensure correct billing of material.

****PROPER LABELING OF THE CONTAINER IS REQUIRED BY D.O.T. FOR SHIPPING PURPOSES. E-RECYCLING OF CALIFORNIA CAN HELP PROVIDE THIS INFORMATION FOR YOU****

SECTION 2 / BATTERY RECYCLING



BATTERY TYPES

CATEGORY 1 **SEALED LEAD ACID**

B1

These batteries are sealed and are commonly found in cars, building alarm systems, forklifts, and other vehicles. Notice they cannot be filled. **The terminals must be taped prior to palletizing and shipping.**



CATEGORY 1 **WET CELL LEAD ACID**

B1

These batteries are made to be filled with battery acid or de-ionized water and will have caps that can be removed. Some are on top, and others will have square covers that need to be removed first to get to the caps. These batteries can be found in cars, watercraft, forklifts, golf carts, and aircrafts. **The terminals must be taped prior to palletizing and shipping.**



CATEGORY 1 **ABSOLYTE OR GEL CELL**

B1

These batteries can look like lead acid, though they will be marked "Absolyte" or "Gel." These batteries can be found in buildings that use backup systems, electric wheelchairs, and some vehicles. Most Absolyte or Gel batteries will be encased in steel cases if used in a building; Gel batteries in wheelchairs or cars will not be. **The terminals must be taped prior to palletizing and shipping.**



CATEGORY 1

UPS BATTERY BACKUP

B1 **B4**

These batteries are Sealed Lead Acid but will be encased. They are used with computers to keep a constant power supply and are usually found under a desk.



Larger units are used in Data Centers and will be found in a rack.

CATEGORY 2

WET NI-CAD

B1

These batteries are “Wet” Ni-Cad; please note you will find other types of Ni-Cad batteries in different battery categories on this list. This type can be found in buildings used for backup systems. **The terminals must be taped prior to palletizing and shipping.**



CATEGORY 2

DRY CELL

B2

These batteries will all look very similar and are commonly called “household batteries.” The following will be accepted in this category: Alkaline, Nickel Cadmium (Ni-Cad), Zinc Air Nickel Iron, Carbon Zinc, Nickel Metal Hydride, and rechargeable. Please note that Mercury and Lithium batteries can look similar and must be separated from Category 2 batteries. Do not mix with other types.



CATEGORY 2

NI-MH, Ni-Cd

B2

These are Ni-Cad; they are power tool batteries. Notice the “NI-MH, Ah, or Ni-Cd” lettering. Some power tools have lithium; be sure to check. **Tape terminals prior to packaging and shipping.**



CATEGORY 3

MERCURY CONTAINING

B2



These batteries contain mercury and come in all shapes and sizes. Silver Oxide also is in this category. Do not mix these batteries with Category 2 or 4. **These are a rare type.**

CATEGORY 4

REACTIVE

B3*



These batteries are known as Lithium batteries and may be called Lithium Ion or Lithium Metal. They can look like a Category 2 battery but are wrapped in plastic like the photo shows or they will be clearly marked. Some are found in cell phones, laptops, or other small electronics. Some look like watch batteries.

Terminals must be taped prior to packaging and shipping. Do not mix with other categories as they are a fire hazard.

***Special Note: You may not use pails larger than 5 Gallon size. It is not allowed by D.O.T.**

CATEGORY 5

LITHIUM ION

B3



These power tool batteries are Lithium. Notice the "Lithium, Lithium-Ion, or Li-Ion" lettering. They can also look like Ni-Cd; be sure to

Terminals must be taped prior to packaging and shipping. Do not mix with other categories.

read the label.

See new DOT Regulation updates November 2021 for updates to Lithium Battery Rules inserted at the end of this document.

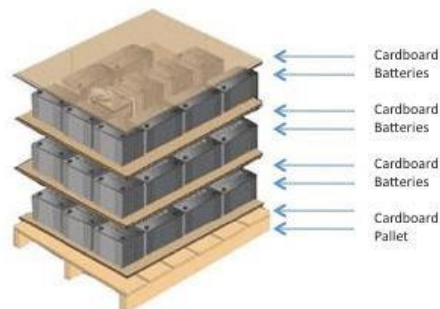
BATTERY PACKAGING GUIDE

PACKAGING #1

PALLETS WITH SHRINK WRAP

B1

All batteries in this category must have the terminals taped prior to palletizing and transport. Place cardboard or a piece of wood over pallet first so batteries do not fall through slats and get punctured by forks of forklifts. Place batteries on pallet securely. If stacking more than 1 row (no more than 2), place a piece of cardboard on top of batteries first then stack next row. Shrink wrap pallet tightly and/or use banding straps and label.



See “Taping of Battery Terminals” on page 19 for example.

PACKAGING #2

**1 GALLON, 5 GALLON, OR 10 GALLON PAILS
15 GALLONS TO 55 GALLON POLY DRUMS OR
METAL DRUMS. ALL PAILS AND DRUMS MUST
HAVE LIDS AND LOCK RINGS.**

B2

Containers must be D.O.T. approved.

Label packaging to identify battery types with Universal Waste Labels.
Do not mix batteries from different categories inside of packaging.



PACKAGING #3

**1 GALLON, 5 GALLON, OR 10 GALLON PAILS
15 GALLONS TO 55 GALLON POLY DRUMS
ONLY ALL PAILS AND DRUMS MUST HAVE LIDS
AND LOCK RINGS. DO NOT USE METAL
DRUMS.**



Containers must be D.O.T. approved.

Label packaging to identify battery types with Universal Waste Labels. Do not mix batteries from different categories inside of packaging. **All terminals must be taped prior to packaging & shipping.**

See “Taping of Battery Terminals” on page 19 for example.

***Special Note: You may not use pails larger than 5 Gallon size.**

PACKAGING #4

**SEALED CARDBOARD BOX
GAYLORD BOX WITH LID**



Containers must be D.O.T. approved.

These are self-contained electronic devices that house a lead acid battery only. Do not put any open containers, loose batteries, or leaking broken batteries in this packaging. Do not mix batteries from different categories inside of packaging. Boxes must be kept out of the weather. Please use Universal Waste Labels on packaging to identify as e-waste.

UNIVERSAL WASTE LABEL** **(GENERATOR RESPONSIBILITY)**

Please use a Universal Waste Label on all packaging or containers while stored in your facility to clearly identify the type of waste you are storing and for how long.

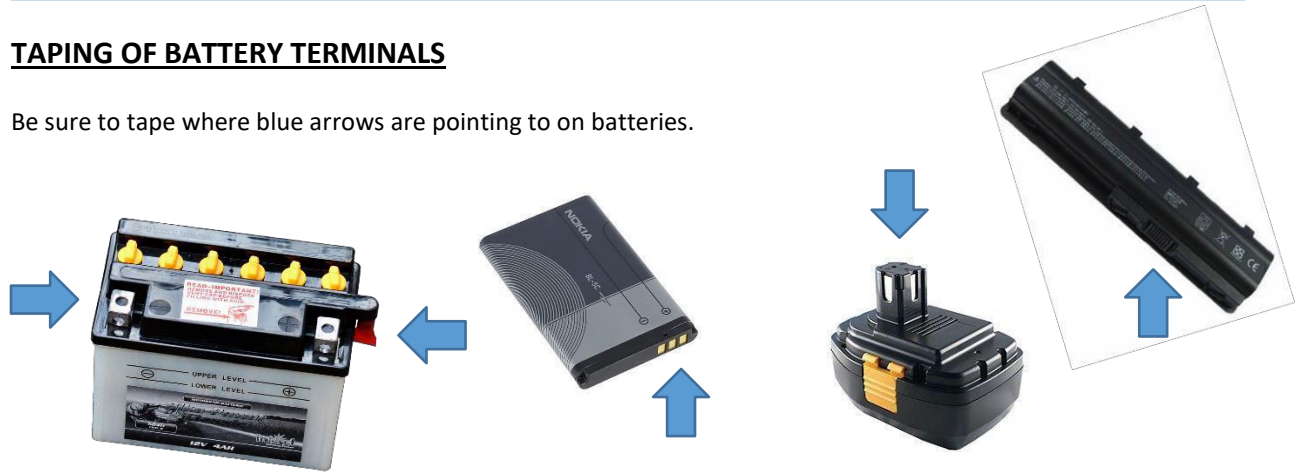
A Universal Waste Label must be on all packaging or containers prior to pick up.

****Failure to do so may result in fines during Regulatory Inspections.**

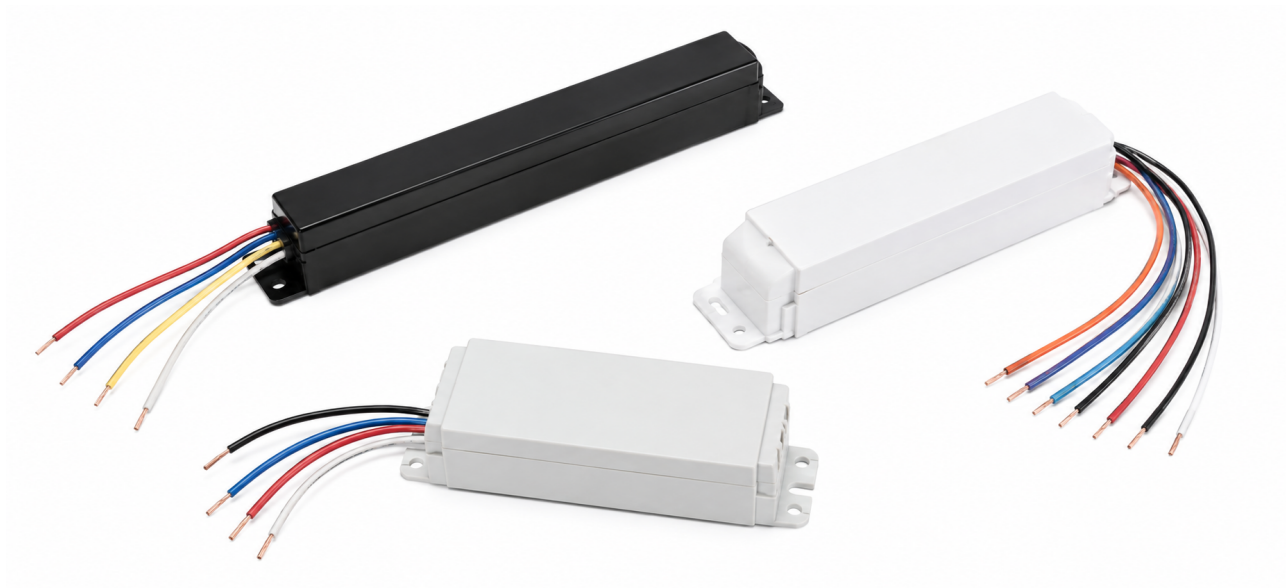
Universal Waste	
☐	Universal Waste – CRT(s)
☐	Universal Waste – CRT Glass
☐	Universal Waste – Electronic Devices
☐	Universal Waste – Battery(ies)
☐	Universal Waste – Mercury – Containing Equipment
☐	Universal Waste – Lamp(s)
☐	Universal Waste – _____
☐	Universal Waste – _____
Accumulation Start Date: _____	
HANDLE WITH CARE	

TAPING OF BATTERY TERMINALS

Be sure to tape where blue arrows are pointing to on batteries.



SECTION 3 / BALLAST RECYCLING



SHIPPING AND PACKING GUIDELINES

FLUORESCENT LIGHTING BALLAST

- Ballasts must be removed from light fixtures with care, so as not to cause any leakage as result of removal.
 - Segregate Non-PCB/Electronic VS. PCB Ballast, if the ballast is not separated, you will be billed at a higher rate.
 - Any ballast that exhibits leakage MUST be handled with heavy rubber gloves.
 - All leaking ballasts must be separated from intact, non-leaking ballasts. Leaking ballasts should be packaged in double plastic bags and placed in a separate lined drum labeled as containing leaking fluorescent lighting ballasts. These will ship as a hazardous waste on manifest.
 - All intact ballast should have all wires snipped as close to the body of the ballast as possible.
 - Drums for transporting ballasts must be D.O.T. rated 1A2Y1.5-100 (17C0 or 1AZ-Y-300 (17H). These drums can, if required, be supplied by e-Recycling of California at an additional charge.
 - Ballast must be packed into the drums with care, to cause any leakage because of packing.
 - Ballast drums cannot contain other material or waste except fluorescent lighting ballasts.
 - No absorbent material should be used in the drums.
 - No more than 750 pounds of ballasts should be loaded into each drum. This is about 185 four-foot ballasts, one hundred eight-foot slimline ballasts, 75 eight-foot High Output ballasts, or 50 eight-foot Very High Output ballasts.
 - All drums should be labeled with the proper Universal or Hazardous Waste Labels.
 - All packed drums must be on a loading dock or in some other spot accessible to a 10 x 50-foot (or a 9 x 26 foot) truck. If drums are not on a paved surface, plywood must be placed under to allow their movement with a drum jack.
 - Be mindful of placing too many packed drums on pallets because of the weight and mobility of pallets.
-

SECTION 4 / MERCURY DEVICE RECYCLING



Mercury Devices are NOT accepted at ERC and are considered non-Conforming wastes, while some items can be managed as Universal Waste most of the items must be managed as Hazardous Waste. For the latest updates on the Management of Mercury please visit <http://dtsc.ca.gov/HazardousWaste/Mercury/index.cfm>.

SECTION 6 / ELECTRONICS SORTING & PACKAGING



Best Management Practices for Palletizing

- Put monitors of similar size together for stable stacking
- Place intact monitors in layers, with 9 or 12 units per layer
- To prevent breakage do not stack the monitor face down on pallets
- Starting from the bottom up tightly shrink wrap the monitors onto the pallet



e-Rack

- Maximum 20-22 units depending on the size
- Maximum of approximately 800-900 lbs.
- 27" + Televisions/Monitors or Large Electronic Waste Items should be palletized
- Each e-Recycling Rack is labeled with Asset Numbers and Tare Weights
- If for some reason an e-Recycling Rack is overfilled, makes sure to Shrink Wrap the front sliding door prior to pick up

SECTION 7 / PV MODULES

Packaging and Containment

- Stack modules flat on a sound, appropriately sized pallet.
- Group modules of similar dimensions and align all edges.
- Use a rigid top sheet plus corner and edge protection.
- Stretch-wrap the full stack and strap it securely to the pallet.
- Avoid unsupported overhang; do not stack damaged modules vertically.



ACCEPTABLE: FLAT, ALIGNED, EDGE-PROTECTED, WRAPPED AND STRAPPED

Confirm pallet capacity, stack height and carrier requirements before shipment.

U.S. DEPARTMENT OF TRANSPORTATION NEW LITHIUM BATTERY RULES Pursuant to HM-224F

The Department of Transportation (DOT) has adopted many of the requirements currently in place in the 2013-2014 International Civil Aviation Organization's (ICAO) Technical Instructions for Safe Transport of Dangerous Goods by air. Therefore, ground transport of lithium batteries are now more closely aligned with the 55th edition of the IATA Dangerous Goods Regulations, which are more stringent than the rules previously in place for ground shipments. These rules will help to standardize for shippers the way in which lithium batteries and equipment powered by such batteries are shipped. DOT has not made the lithium battery regulations more stringent than ICAO to avoid any undue negative impact on U.S. battery manufacturers or shippers.

Here are six things you need to know about the new rules:

1. NEW PROPER SHIPPING DESCRIPTIONS

Effective with this rule change, there will be six unique basic shipping descriptions listed in the HMT, instead of just two descriptions prior to the rule changes.

Proper Shipping Name	ID Number	Hazard Class	PG
Lithium ion batteries	UN3480	9	II
Lithium ion batteries contained in equipment	UN3481	9	II
Lithium ion batteries packed with equipment	UN3481	9	II
Lithium metal batteries	UN3090	9	II
Lithium metal batteries contained in equipment	UN3091	9	II
Lithium metal batteries packed with equipment	UN3091	9	II

NOTE: Lithium ion batteries include lithium ion polymer batteries.

NOTE: Lithium metal batteries include lithium alloy batteries.

2. ADOPTION OF WATT-HOUR RATINGS FOR LITHIUM ION BATTERIES

Prior to the new rules, shippers have had to use equivalent lithium content (ELC) as a measure of energy in a lithium ion battery. ICAO/IATA and IMDG have long used the more typical and easier to obtain Watt-hour (Wh) rating. Beginning in 2016, battery manufacturers will be required to mark each lithium ion battery with the Wh rating; DOT is removing all references to ELC and adopting Wh.

DOT is not changing the values the shipper uses to determine if a lithium battery is "small", and therefore "excepted" from the regulations. **SMALL** lithium metal cells are those containing ≤ 1 g lithium per cell or ≤ 2 g lithium per battery. These are still "excepted". **SMALL** lithium ion cells are those rated at ≤ 20 Wh per cell or ≤ 100 Wh per battery. These are also still "excepted". However, refer to the Exceptions sections 4 and 5 for further information.

3. REVISION, REMOVAL AND CONSOLIDATION OF MOST SPECIAL PROVISIONS

DOT has removed, consolidated and relocated many of the special provisions related to lithium batteries. The "small lithium battery exception" and the "medium lithium battery exception", which were previously found in DOT special provisions 188 and 189, respectively, have been revised and relocated to 49 CFR 173.185 (c). This is the packaging section for lithium batteries referenced in column 8 of the hazardous materials table.

4. THE SMALL LITHIUM BATTERY EXCEPTION (Previously DOT SP 188)

This is the most significant change in the new regulation.

Prior to the new regulations, shippers of “small lithium batteries” have enjoyed significant regulatory relief in ground shipment of the batteries. For example, most packages containing ≤ 24 cells or ≤ 12 batteries were not required to be marked that they contained lithium batteries, and they were not required to be accompanied by any special documentation. In order to align with ICAO/IATA, DOT has changed this exception, especially as it relates to package testing and hazard communication.

According to the new DOT regulations, battery packages being shipped by ground must be marked and labeled the same way as they have been for shipment by air. See charts below for new requirements.

NEW PACKAGE REQUIREMENTS FOR EXCEPTED SMALL LITHIUM BATTERIES – GROUND (Packages do NOT need to be UN certified)

What is in the package?	How many?	Package Tests	Package Weight Limits
Lithium ion batteries	1 or more	1.2 m drop test	66 lb. (30 kg) gross
Lithium ion batteries contained in equipment	1 or more	None	None
Lithium ion batteries packed with equipment	1 or more	1.2 m drop test	None
Lithium metal batteries	1 or more	1.2 m drop test	66 lb. (30 kg) gross
Lithium metal batteries contained in equipment	1 or more	None	None
Lithium metal batteries packed with equipment	1 or more	1.2 m drop test	None
Button cells contained in equipment	Unlimited	None	None

NEW HAZARD COMMUNICATION REQUIREMENTS FOR EXCEPTED SMALL LITHIUM BATTERIES - GROUND

What is in the package?	How many?	Lithium Battery Warning Label?	Primary Lithium Batteries – Forbidden for Transport Aboard Passenger Aircraft	Lithium Warning Document?
Lithium ion batteries	1 or more	Yes	No	Yes
Lithium ion batteries contained in equipment	≤ 4 cells or 2 batteries	No	No	No
Lithium ion batteries contained in equipment	> 4 cells or 2 batteries	Yes	No	Yes
Lithium ion batteries packed with equipment	1 or more	Yes	No	Yes
Lithium metal batteries	1 or more	Yes	Yes, this marking is required regardless of the number of batteries in the package	Yes
Lithium metal batteries contained in equipment	≤ 4 cells or 2 batteries	No	Yes, but only if the package contains more than 11 lbs (5 kg) net weight of batteries	No
Lithium metal batteries contained in equipment	> 4 cells or 2 batteries	Yes	Yes, but only if the package contains more than 11 lbs (5 kg) net weight of batteries	Yes
Lithium metal batteries packed with equipment	1 or more	Yes	Yes, but only if the package contains more than 11 lbs (5 kg) net weight of batteries	Yes

Note that the lithium battery warning label may be the red bordered label used in IATA or an alternative marking that includes all required information. The lithium warning document is NOT a hazmat bill of lading, but can be printed on the BOL. The document is required per shipment, not per package. Packages containing only button cell batteries installed in equipment do not need to display any marks or labels or be accompanied by any document.

Requirements for the shipment of small lithium cells and batteries by air under 49 CFR are now identical to those found in Section II (or 1B) of the relevant IATA packing instructions. Please refer to the 49 CFR or IATA regulations for complete requirements.