

## LITHIUM BATTERY TRANSPORTATION FAQs



### SUMMARY

Lithium batteries can overheat and catch fire under certain conditions and the fires can be hard to extinguish and may produce toxic fumes. As a result, there are a number of requirements associated with shipping lithium batteries.

Anyone who offers lithium batteries to a carrier for transportation, including products packed with lithium batteries, or products containing lithium batteries, or anyone who transports them in commerce is subject to the [Hazardous Materials Regulations \(HMR\)](#) of the [Pipeline and Hazardous Materials Safety Administration \(PHMSA\)](#) within the U.S. Department of Transportation as well as any applicable state or international regulations for transporting hazardous materials.

Common carriers, such as overnight delivery services or the U.S. Postal Service, may impose additional restrictions on lithium batteries. For example, some overnight carriers require compliance with international air regulations, such as the [International Air Transport Association \(IATA\) Dangerous Goods Regulations](#). The U.S. Postal Service imposes its own restrictions on shipping lithium batteries domestically and through international mail. It is important to check with your carrier to make sure you are complying with their requirements for shipping lithium batteries.

### HOW DO I RECOGNIZE LITHIUM BATTERIES?

If you distribute or sell button cell, cylindrical, or other batteries containing either lithium ion chemistries (also known as lithium polymer, rechargeable, or secondary batteries) or lithium metal chemistries (also known as lithium alloy or primary batteries), you are probably subject to the HMR. Also, many products contain lithium batteries, including:

- Laptop computers and tablets
- Mobile phones
- Watches
- Toys
- Cameras
- Cordless power tools
- Novelty products
- Greeting cards
- Lawn mowers

Shipping products packed with or containing lithium batteries also subjects you to the HMR.

## WHAT DO I NEED TO KNOW?

Retailers need to know a lot of information about their products before they can ship lithium batteries or products containing lithium batteries or packaged with lithium batteries.

**1. UN tests for safety.** All designs and types of lithium batteries you ship must be tested by the manufacturer and meet the requirements of the [UN Manual of Tests and Criteria](#). Battery designs and types that have not been tested are prohibited from transportation in commerce.

**2. Lithium metal or lithium ion batteries.** You need to know whether you have lithium metal or lithium ion batteries in order to identify the applicable shipping requirements and to ensure proper labeling.

**3. Size of batteries.** Small lithium batteries have different requirements than medium or large lithium batteries. For these purposes, size is determined by lithium content for lithium metal batteries and Watt-hour rating (Wh) for lithium ion batteries. Generally, small lithium metal batteries have no more than 1 g lithium per cell and 2 g lithium per battery; small lithium ion batteries have no more than 20 Wh per cell and 100 Wh per battery. Size information may be available on a battery's Safety Data Sheet or from the battery manufacturer. Lithium ion batteries manufactured after 2011 should have the Wh marked on the outside case of the battery.

**4. Number and configuration of batteries.** Consumer product packaging may contain lithium batteries by themselves, equipment with lithium batteries installed, or equipment with lithium batteries that are not installed (e.g., spare batteries or separate battery packs). The shipping requirements differ for each of these scenarios and can also vary based on the number of batteries in a package, overpack, and consignment.

**5. Mode of transportation.** Shipping requirements differ by mode. Some packages of batteries that can be shipped by motor vehicle are prohibited from air transport. In general, there are more restrictions when shipping by air, including:

- Limitations on the number of lithium batteries that can be shipped in a single package, overpack or consignment;

- Limitations on the state of charge of lithium ion batteries shipped by themselves; generally, the state of charge must not exceed 30% of the battery's rated capacity;
- Prohibition on lithium ion and lithium metal batteries shipped by themselves on passenger aircraft; they must carry the "cargo aircraft only" label or a similar marking;
- Prohibition on air shipment of lithium batteries that are damaged, defective or recalled due to safety concerns, including batteries packed with or contained in equipment;
- Prohibition on air shipment of lithium batteries by themselves when sent for recycling or disposal.

## HOW DO I SHIP LITHIUM BATTERIES?

**1. Package for safety.** Lithium batteries must be packaged in a manner that protects against short circuits and overheating. Protective measures may include separation from metal objects and cushioning. In general, equipment containing lithium batteries must not be switched on (even accidentally) during transportation.

**2. Other packaging requirements.** Packaging requirements vary based on the size of the batteries, the mode of transportation, the quantity of batteries, and whether the batteries are by themselves, packed with equipment or contained in equipment. Depending on these factors, acceptable packaging may range from strong rigid outer packagings to UN specification packagings of the type required for Class 9 hazardous materials.

**3. Marking and labeling.** Like other requirements, marking and labeling vary based on the size of the batteries, the mode of transportation, the quantity of batteries, and whether the batteries are by themselves, packed with equipment or contained in equipment. There are essentially two options, either the Lithium Battery Mark or the Class 9 Lithium Battery Label. If the lithium batteries fall within the size limitations to be considered "small" (or the somewhat higher lithium or Watt-hour limits if transported by motor vehicle or rail in the United States), the Lithium Battery Mark generally applies. However, there are some exceptions to labeling for button cells and two or fewer small batteries in a package/consignment of lithium batteries contained in equipment.

Quantity limits for small batteries are more stringent for air transportation (e.g., no more than two batteries without equipment per package/overpack/consignment or no more than 5 kg net battery weight for batteries packed with or contained in equipment). If these quantity limits are exceeded, the batteries must be shipped as Class 9 hazardous materials and must carry the Class 9 Lithium Battery Label. In some cases, if the quantity limits for air transportation are only modestly exceeded, the batteries may be eligible for reduced Class 9 requirements, but they must carry both the Lithium Battery Mark and the Class 9 Lithium Battery Label.

Lithium batteries that don't meet the definition of "small" (or that don't meet the somewhat higher lithium or Watt-hour limits if transported by motor vehicle or rail in the United States) must be shipped as Class 9 hazardous materials and must carry the Class 9 Lithium Battery Label.

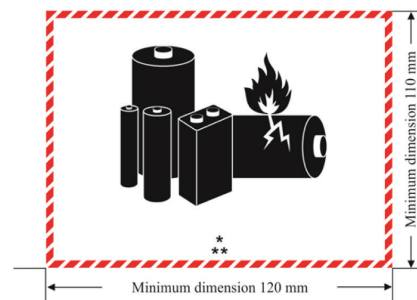
The requirements for marking and labeling recently changed, and the new Lithium Battery Mark and Class 9 Lithium Battery Label is mandatory as of January 1, 2019 in the U.S.

**4. Documentation.** Specific documentation requirements vary based on the size of the batteries, the mode of transportation, and the quantity of batteries. The requirements for small lithium batteries changed recently, and an accompanying document is no longer required. Lithium batteries that must be shipped as Class 9 hazardous materials must have hazardous materials shipping papers, including a signed certification.

**5. Training.** Specific training requirements vary based on the size of the batteries, the mode of transportation, and the quantity of batteries. When shipping small lithium batteries by air, employees must receive "adequate instruction." More information on what constitutes adequate instruction can be found in the [IATA Lithium Battery Guidance Document](#). When shipping lithium batteries as Class 9 hazardous materials, employees must receive full hazardous materials transportation training.

**6. Incident reporting.** An incident during transportation resulting from a battery or from battery-powered equipment must be reported to PHMSA if it involves fire, violent rupture, explosion, or a dangerous evolution of heat (i.e., heat that would be dangerous to packaging or personal safety, including charring, melting, or scorching of packaging).

## New Lithium Battery Mark mandatory as of January 1, 2019



- \*Place for UN Number(s):
- UN 3090 [Lithium metal batteries]
- UN 3091 [Lithium metal batteries packed with or contained in equipment]
- UN 3480 [Lithium ion batteries]
- UN 3481 [Lithium ion batteries packed with or contained in equipment]
- \*\*Place for telephone number for additional information

## New Class 9 Lithium Battery Label Mandatory as of January 1, 2019



## ARE THERE ANY EXCEPTIONS?

**Vehicles or mechanical equipment.** Lithium batteries contained in some types of vehicles or mechanical equipment may be exempted from the HMR if certain minimal conditions are met.

**Lithium batteries shipped for disposal or recycling.** Lithium batteries sent for disposal or recycling may be exempted from certain requirements of the HMR, including UN testing and UN specification packaging.

**Prototype batteries.** Batteries that have not yet been subjected to the UN tests may be shipped if certain additional measures are taken to ensure their safe transportation, such as more extensive packaging and marking.

**Special permits.** PHMSA may provide a case-by-case exception in the form of a Special Permit if it can be shown that an equivalent level of safety can be achieved by following alternative procedures for shipping lithium batteries under specific circumstances.

## HOW DO I SHIP DAMAGED, DEFECTIVE OR RECALLED BATTERIES?

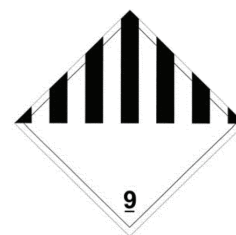
Lithium batteries that are damaged, defective, or recalled for safety reasons (including batteries with the potential to overheat, catch fire, or short circuit) cannot be shipped by air. However, these batteries may be shipped by highway, rail or vessel in the United States if additional measures are taken to ensure safe transportation, such as more extensive packaging and marking.

### Former Lithium Battery Handling Label



- \*Place for "Lithium Ion Batteries" and/or "Lithium Metal Batteries"
- xxx.xxx.xxxx Place for telephone number for additional information

### Class 9 Label



## ABOUT THE RETAIL COMPLIANCE CENTER

The Retail Compliance Center (RCC) provides resources on environmental compliance and sustainability for all types and sizes of retailers. The RCC's goal is to develop retail-specific resources, tools and innovative solutions to help companies cost-effectively improve their compliance and environmental performance.