

HAZMAT AWARENESS CAMPAIGN - Service Talk

Proper Handling of Lithium Batteries

Batteries have become an essential part of modern life. Batteries power portable computers, phones, and other electronic devices. Today's batteries contain more power than ever before and, as a result, pose a heightened risk for mailing. Batteries can present chemical (e.g. corrosive electrolytes), electrical and fire hazards. Mail pieces containing batteries, especially lithium batteries, can be dangerous if not properly packaged and identified. The proper packaging and identification of mail pieces containing lithium batteries is critical in ensuring their appropriate handling in USPS networks. It is important that mailers comply with all applicable mailing standards when mailing lithium batteries.

On March 2, 2015, the Postal Service revised its mailing standards relating to the transportation of lithium batteries. These revisions were made in order to align USPS lithium battery regulations with those of the Department of Transportation (or DOT) and other federal regulatory agencies.

What are lithium batteries?

- **Lithium metal batteries** (or lithium alloy batteries) are disposable non-rechargeable batteries that use lithium metal or lithium alloys as an anode. Lithium cells can produce voltages from 1.5 volts to about 3.7 volts, over twice the voltage of ordinary zinc-carbon or alkaline batteries. Lithium metal batteries are widely used in products such as portable consumer electronic devices (cameras and flashlights).
- **Lithium-ion batteries** (or lithium polymer batteries) represent a variety of rechargeable battery chemistries in which ions shuttle from the negative electrode to the positive electrode during discharge, and then back when charging. Unlike lithium metal batteries (which are disposable), lithium-ion electrochemical cells are rechargeable and can be used over and over again. Lithium-ion cells and batteries typically power devices such as laptops and cell phones.
- **Very Small Lithium Metal or Lithium-ion Batteries** is a new category, for domestic mail only, introduced by the Postal Service to align with the DOT. These batteries (under 0.3 gram of lithium content for lithium metal and under 2.7 watt/hours for lithium-ion) are mailable without a quantity limitation when installed in, or packaged with equipment. When very small lithium batteries are mailed without equipment, they are subject to the same mailing requirements as larger batteries.

Why lithium batteries are regulated in transportation.

Most lithium batteries contain a flammable element (electrolyte), providing more energy that can overheat and ignite under certain conditions. The need for greater regulation is to ensure the safety of the public, USPS employees and property when these batteries are being shipped. Improper packaging and handling can result in short circuits, leading to overheating that can result in fire or explosion.

What Should Employees Do?

If you are an acceptance employee and see any of these lithium battery markings on a package, question the mailer about the acceptable domestic mailing limits for lithium batteries. If you are a plant employee and find a package marked **“Surface Mail Only, Lithium Metal Batteries - Forbidden for Transportation Aboard Passenger Aircraft”** and it is going on a passenger aircraft, please retain the package and contact your supervisor. Allowing this package on a passenger aircraft will endanger all aboard.

If the package has an international destination (or APO/FPO/DPO destination), question the mailer about the acceptable international lithium battery limits and ask if the lithium batteries are properly installed in a piece of equipment. **Lithium batteries that are not installed in the equipment they operate are not acceptable for international destinations, including APO/FPO/DPO locations.**

Frequently Asked Questions:

What is the different between a lithium battery and a lithium cell?

- **Lithium cell** means a single encased electrochemical unit with a single positive electrode (anode) and single negative electrode (cathode), which exhibits a voltage differential across its terminals. For the purpose of mailability, marking, and documentation requirements, a single cell lithium battery is classified as a lithium cell. Cell phone batteries are typically single-cell batteries.
- **Lithium battery** means one or more lithium cells which are electrically connected together by a permanent means, including case, terminals and markings.

What are the marking requirements for lithium batteries?

Mail pieces with more than 4 lithium cells or 2 lithium batteries installed in equipment, must now bear markings and be accompanied by written documentation. Mail pieces with 4 or less cells or 2 or less batteries may optionally bear markings. Mail pieces containing lithium batteries packaged with equipment or lithium batteries mailed without equipment must bear markings and be accompanied by written documentation when any mailable amount of batteries are mailed. As a result, USPS employees should expect to see lithium battery markings more often than in the past. There are a number of acceptable variations to fulfill the marking requirement. One of the more common markings is shown below, but others can be used. See Publication 52 or the February 5, 2015 edition of the *Postal Bulletin* (issue 22408) for details.



The only exception is for lithium batteries in international shipments, including APO/FPO/DPO addresses. International mail pieces must never bear lithium battery markings.

What are the new written documentation requirements?

The DOT, and now the Postal Service, requires all mail pieces that are required to bear a lithium battery marking to also include a separate written document. This written documentation must include:

- An indication that the package contains “lithium metal” or “lithium-ion” cells or batteries, as appropriate;
- An indication that the package is to be handled with care and that a flammable hazard exists if the package is damaged;
- An indication that special procedures must be followed in the event the package is damaged, to include inspection and repacking, if necessary; and
- A telephone number for additional information.

Typically, this written document will be provided in the form of a peel-off label or a written document placed in a pouch and affixed to the mail piece.

What are the Specific Marking/Documentation Requirements?

- **Lithium Metal or Lithium-Ion Batteries – Installed in Equipment**
- Mail pieces with less than 4 cells or 2 batteries are not required to bear markings or be accompanied by documentation. Mail pieces with over 4 cells, up to the maximum of 8 cells, must bear an applicable DOT-approved lithium battery handling label (or its equivalent) and be accompanied by written documentation. Mail pieces with 4 or less cells or 2 or less batteries may optionally include markings and documentation.
- **Lithium-Ion Batteries or Lithium Metal Batteries – Mailed With Equipment**
- These mail pieces must bear an applicable DOT-approved lithium battery-handling label (or its equivalent) and be accompanied by written documentation.
- **Lithium Metal Batteries – Mailed Without Equipment**
- These mail pieces must bear an applicable DOT-approved lithium battery-handling label (or its equivalent) and be accompanied by written documentation. In addition, these mail pieces must also bear a “**Surface Mail Only, Lithium Metal Batteries - Forbidden for Transportation Aboard Passenger Aircraft**” marking. Lithium metal batteries mailed without equipment are acceptable for surface transportation only.
- **Lithium-ion Batteries – Mailed Without Equipment**
- These mail pieces must bear an applicable DOT-approved lithium battery-handling label (or its equivalent) and be accompanied by written documentation. In addition, these mail pieces must also bear a “**Package Contains Lithium-ion Batteries (No Lithium Metal)**” marking.
- **Very Small Lithium Metal or Lithium-ion Batteries**
- When very small lithium metal or lithium-ion batteries also qualify as button-cell batteries (see Pub 52 or *Postal Bulletin* 22408 for details) and are installed in equipment, no marking or documentation is required. Otherwise, these batteries are subject to the marking and documentation requirements described above.

What are acceptable Domestic and International limits?

Lithium Battery Mailability – print and post

	Surface Transportation	Air Transportation	Domestic Mail piece Limitations¹	International Mail piece Limitations
Lithium Metal or Lithium Alloy Batteries^{2, 3} <i>Small non-rechargeable consumer-type batteries</i>				
Contained in (properly installed in equipment)	Mailable	Mailable	8 cells or 2 batteries 11lbs.	4 cells or 2 batteries
Packed with equipment, but not installed in the equipment	Mailable	Mailable	8 cells or 2 batteries 11lbs.	Prohibited
Without the equipment they operate (individual batteries in originally sealed packaging)	Mailable	Prohibited	5 lbs.	Prohibited
Lithium-ion or Lithium Polymer Batteries^{4, 5} <i>Small rechargeable consumer-type batteries</i>				
Contained in (properly installed in equipment)	Mailable	Mailable	8 cells or 2 batteries	4 cells or 2 batteries
Packed with equipment, but not installed in the equipment	Mailable	Mailable	8 cells or 2 batteries	Prohibited
Without the equipment they operate (individual batteries in originally sealed packaging)	Mailable	Mailable	8 cells or 2 batteries	Prohibited
Very Small Lithium Metal or Lithium-ion Batteries^{6, 7} <i>Exception for very small consumer-type batteries in USPS air transportation</i>				
Contained in (properly installed in equipment)	Mailable	Mailable	No limit on cells/batteries 5.5 pounds	4 cells or 2 batteries
Packed with equipment, but not installed in the equipment	Mailable	Mailable	No limit on cells/batteries 5.5 pounds	Prohibited
Damaged/Recalled Batteries	Prohibited, unless approved by the manager, Product Classification.			Prohibited

1. When a mail piece limitation of 8 cells or 2 batteries is applicable, a mail piece may contain either 8 cells or 2 batteries, not both.
2. Each cell must not contain more than 1g lithium content.
3. Each battery must not contain more than 2g aggregate lithium content.
4. Each cell must not exceed more than 20 Wh (watt-hour rating).
5. Each battery must not exceed 100 Wh.
6. Each lithium metal or lithium alloy cell or battery must not exceed 0.3 gram of lithium content.
7. Each lithium-ion or lithium polymer cell or battery must not exceed 2.7 Wh.