

LITHIUM BATTERIES
AND
Hazardous Materials
PCC Workshop-in-a-Box



Today's topic is Hazardous Materials, with a specific focus on lithium batteries, common household goods, and international .

Overview

- *Lithium batteries – Recent Developments*
 - *DOT Regulations*
- *Firearms*
- *Common Household Products*
- *International*
- *Resources*

This presentation will provide key components to the recent lithium battery requirements. It will also provide information on items frequently found in the mail that may, or may not, be permitted by law.

Make a Difference

- Front line information resource to your local offices and businesses.
- Be knowledgeable and familiar with the regulations for mailing hazardous, and restricted materials.
- Educate, educate, educate.



How can I make a difference?

Knowledge is key – reading the Postal Bulletin for any changes to Publication 52, *Hazardous, Restricted, and Perishable Mail*, is crucial to staying on top of the latest changes to hazardous materials requirements.

Lithium Batteries



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Lithium batteries come in all shapes and sizes: you may be familiar with some of these.

Lithium-ion batteries are known as “secondary” or “rechargeable.” You find these typically in cell phones and laptop computers.

Lithium metal batteries are known as “primary” or “nonrechargeable.” You find these typically in cameras and flashlights.

Button cells are small single-cell round batteries, typically used to power small portable electronic devices such as wrist watches, pocket calculators, and hearing aids. (Button cell batteries are almost always use lithium metal chemistry.)

Cells mean a single encased (electro-chemical) unit.

Battery means one or more cells which are connected together by a permanent means, including case, terminal, and markings.

UPS - Dubai, United Arab Emirates Sept. 3, 2010



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This is what (can) happen when lithium batteries are faulty, not packaged properly, or are shipped undeclared. There are very specific packaging and shipping requirements for both domestic and international mailings.

August 2014

Returned by customer using
a Priority Mail flat rate box



Shipped from manufacturer to
customer via commercial
carrier



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It may be a little hard to see, but each of the horizontal silver plates in the green container are lithium batteries. Based on current Publication 52 standards, this (battery pack) does not meet any of the requirements for quantity and packaging.

The second item to the right was a return. The original batteries were shipped to the customer, who opened all the packages, decided the batteries were damaged, and then threw all the batteries together in one Priority Mail Flat Rate Box and mailed it back to the company. Per Pub 52, to ship any recalled or damaged batteries must first obtain written approval from the manager, Product Classification at USPS HQ. And then all instructions for the maximum number, packaging, and marking requirements must be met.

There are reasons why the requirements must be met. You saw the plane, let's look at another mailpiece.

September 2014

Separate lithium battery sent by
online retailer



An individual battery was mailed in a padded bag with no other padding or packaging.



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This is what can happen when packaging requirements are not met. In this case, the battery started sparking, and then caught fire which burned other packages in the same container. Single batteries, not in its original manufacturer's packaging, or installed in equipment (depending on Pub 52 requirements) are never permitted to be mailed.

January 2015

Sent by an online retailer



Package addressed to an APO address – individual lithium batteries are prohibited in international and APO/FPO/DPO mailings

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It is part of our responsibility to ensure that hazardous items are (a) mailable by standard and, (b) packaged and marked correctly. Sometimes, these failures cause damage to other packages in the same container. Others end up like the plane we saw earlier.

Department of Transportation Rulemaking

- PHMSA (Pipeline & Hazardous Materials Safety Administration) writes the requirements for surface and air transportation for the United States.
- Recent revisions to lithium battery standards, now harmonize the United States Postal Service with the UN, ICAO (International Civil Aviation Organization), and IMDG (International Maritime Dangerous Goods Code) standards for consistency throughout the world

Self-explanatory

USPS Rulemaking

- Terminology aligns with PHMSA and the shipping industry
- Adopted new UN number & expanded descriptions for lithium batteries
- Added a new category for very small lithium batteries installed in equipment
- Adopted new quantity limitations
- Provided new marking/documentation requirements
- See Pub 52, section 349

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Based on the 2015 PHMSA revisions, the Postal Service revised its own standard as outlined here. Overall, the Postal Service aligns with DOT air transportation requirements. USPS transports mail on commercial passenger airlines and, therefore, abides by all DOT/PHMAS/FAA requirements applicable to passenger aircraft. With the recent 2015 changes, some air transportation limits were revised to allow the mailing of more single-cell batteries per mailpiece than were previously permitted.

Lithium batteries are classified as a Hazard Class 9 substance.

Very Small Batteries

Have the same rules as lithium metal or lithium-ion

Domestic

- No limit on the number of cells/mailpiece
- Each lithium-ion cell or battery must have a watt-hour rating of not more than 2.7 Wh
- Each lithium metal cell or battery cannot exceed 0.3 gram of lithium content
- Must be **installed in**, or **packed with** (in original packaging) equipment
- Weight limit of 2.5 Kilograms (5.5 lbs.)

International

- Must be **installed in** the equipment they operate
- Cell size/capacity applicable to domestic mailing applies (2.7 Wh / 0.3 gram)
- Still limited to a maximum of 4 cells/mailpiece



When shipping very small batteries, they follow the same requirements as lithium metal or lithium ion; with the packaging and weight limits found here.

Lithium Metal or Lithium Alloy Batteries



Small **nonrechargeable** consumer-type batteries



Domestic

Contained in (properly installed in equipment) 8 cells or 2 batteries

Package cannot exceed 11 pounds

Packed with equipment, but not installed in the equipment

8 cells or 2 batteries

Package cannot exceed 11 pounds

Without the equipment they operate (individual batteries in originally sealed manufacturer's packaging)

Package cannot exceed 5 pounds (Surface Mail Only)

International

Contained in (properly installed in equipment) 4 cells or 2 batteries

Cannot contain more than 1.0g lithium content per cell or more than 2.0g aggregate lithium content per battery

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Lithium metal or lithium alloy batteries, are small **nonrechargeable** consumer-type batteries, commonly found in such items as cameras and flashlights. Whether shipped domestically or internationally, lithium metal batteries cannot contain more than 1.0g lithium content per cell or more than 2.0g aggregate lithium content per battery.

Lithium-ion or Lithium Polymer Batteries



Small **rechargeable** consumer-type batteries



Domestic

Contained in (properly installed in equipment) 8 cells or 2 batteries

Packed with equipment (but not installed in the equipment)

8 cells or 2 batteries

Without the equipment they operate (individual batteries in originally sealed manufacturer's packaging)

8 cells or 2 batteries (Air or Surface Mail)

International

Contained in (properly installed in equipment) 4 cells or 2 batteries

Must not exceed 20 Wh per cell

Must not exceed 100 Wh per battery

Lithium-ion or lithium polymer batteries, are small **rechargeable** consumer-type batteries, commonly found in laptops and cell phones.

Marking & Documentation

Domestic Only

- Aligns with DOT to the extent possible
- Requires markings – unless 4 or less cells or 2 or less batteries are installed in equipment
- Except:
 - Button cells installed in equipment
 - All markings prohibited in international/APO/FPO/DPO
- Allows/requires DOT handling lithium battery label in domestic air transportation (5 to 8 cells)
- Requires a separate written document whenever markings are required

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Again, Pub 52 will provide all the requirements for marking and documentation, but our standards are meant to align with DOT, to the extent possible. Basically, markings are required when the package exceeds 4 cells or 2 batteries and installed in the equipment they operate. Markings are also required for any number of cells/batteries that are packaged with equipment or shipped separately. Dependent on standards, the DOT lithium battery handling label is either required or optional when you have at least 5 cells but no more than the 8 cell maximum. When markings are required, a separate written document indicating battery type, that a flammable hazards exists if damaged, special procedures to follow if damaged, and a telephone number.

REMEMBER: marking and documentation is not required for button cells installed in equipment, and is never permitted in international and APO/FPO/DPO mailings.

Markings



Hazard Class 9 Label



DOT Lithium Battery Handling Label

- The labels shown here are for domestic use only.
- No lithium battery markings are permitted on international packages or to APO/FPO/DPO destinations.

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Remember that the Individual Country Listings in the IMM must be reviewed prior to mailing – many countries prohibit lithium batteries. It's better to be safe than sorry.

Also check the "Overseas Military/Diplomatic Mail" section of the Postal Bulletin to determine prohibitions to APO/FPO/DPO ZIP Code destinations.



Firearms



Firearms

There has been a recent increase in the number of Postal inquiries with regard to firearms:

- Mailability to foreign destinations
- Increased frequency of airline screening
- Private manufacture using 3-D Printers

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The mailability of firearms is typically restricted to those individuals or companies holding licenses issued by the Bureau of Alcohol, Tobacco, Firearms and Explosives still referred to as the “ATF”. This includes curio & relic collectors. The mailability of such items can be found in Pub 52, section 432.

3-D Printer – February 2015

**Supposedly
manufactured
by a 3-D Printer**



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If the 3-D printed firearm is capable of firing, all firearm regulations apply, and the individual who produces the firearm becomes the manufacturer. As such, that individual would be required to comply with ATF requirements if they then transfer ownership of the gun to another. So, unless mailing under the exception that allows the owner of a shotgun or rifle to mail that firearm to themselves, the mailer would have to comply with all applicable mailing standards relating to regular firearm shipments.

Where Can I Find Firearm Standards?

- Domestic Mailing Standards:
 - Pub 52 – Section 43
- International Mailing Standards:
 - International Mail Manual (IMM) – 137
 - Individual Country Listings
 - 540 (Export Regulations)
- Bureau of Alcohol, Tobacco, Firearms and Explosives
 - www.atf.gov

Here is where you can go to find the standards for firearms and other hazardous materials.

Firearms – General

- International shipments must also meet domestic mailing standards
- Receiver or frame = firearm
- All mailings must meet ATF and all other federal, state and local regulations

Regardless of what is accepted by the destination country, all domestic mailing standards apply to items being shipped to international destinations.

Common Household Items



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It might surprise you to learn that many common household items are restricted or prohibited for mailing. Prohibited means it cannot be mailed. An item with a restriction means that before an item can be mailed, all requirements must be met. There may be a restriction on quantity, or packaging, or possibly a specific class of mail that must be used.

Lets take a quick at these.

Common Household Items

Item	Hazard Class	Pub 52 Reference	Can you Mail Domestically?	International?
Bleach	8	348	Restricted quantity, packaging & markings	Prohibited
Alcoholic beverages	3	42	Prohibited	Prohibited
Nail Polish	3	343	Surface only with restrictions	Prohibited
Aerosol sprays	2	342	Surface only with restrictions	Prohibited
Perfumes	3	343	Consumer Commodity only for air	Prohibited
Cigarette lighters	3	343	Surface only with written permission	Prohibited
Cigarettes	n/a	47	Restricted to mailers with permission	Prohibited
Cremated remains	n/a	451	Restricted packaging, markings, and class of mail	Restricted

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As you can see – with each of these items, other than alcoholic beverages, you would need to research the applicable reference in Publication 52 to determine the restriction before mailing. As an example, cremated remains (human ashes) must be double packaged in sift-proof containers. The original inner container must be an urn, and must be cushioned to prevent movement during transit and the outer package must be strong, durable, and sift-proof. The cremated remains label is optional, but it must be sent by Priority Mail Express service only. International mailings must not be prohibited by the destination country per the Individual Country Listings in the IMM.

Hazard Classes

Hazard Class	Type
1	Explosives
2	Gases
3	Flammable & Combustible Liquids
4	Flammable Solids
5	Oxidizing Substances, Organic Peroxides
6	Toxic / Infectious Substances
7	Radioactive Material
8	Corrosives
9	Miscellaneous Hazardous Materials

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There are nine hazard classes as identified by the Department of Transportation's Hazardous Materials Table in 49 CFR. As you might imagine, mailing anything considered an explosive in Hazard Class 1 is strictly prohibited (except for two specific materials requiring a special authorization). Remember, the Postal Service uses commercial passenger-carrying airlines for the transport of mail. All of the rest of the classes have very specific mailing criteria that must be adhered to when mailing.

International Mail



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You cannot assume that anything you can mail domestically can also be mailed internationally. There are more than 192 countries – each with their own set of requirements. Internationally, hazardous materials are also called “dangerous goods.” These terms are used interchangeably.

Permitted in International Mail

- 6.2 Infectious Substance: with restrictions via First-Class Package International Service with Registered Mail service only.
- 7 Radioactive Materials: with restrictions via First-Class Package International Service with Registered Mail service only.
- 9 Misc. Hazardous Materials: prohibited except for certain magnetized materials and lithium (metal) or lithium-ion batteries (the batteries may only be shipped if they are **installed in** the equipment they operate).

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International mail is very restrictive, with only certain items in Hazard Classes 6, 7, and 9 permitted; and then they also must be accepted by the destination country. Notice for Hazard Class 9 that anything containing lithium batteries must have the battery installed in the equipment it operates. The battery is not permitted to be packed with equipment or shipped separately.

Individual Country Listings

Each country has its own listing in the IMM where mailers can find prohibitions and restrictions or general observations. Here is just a short sample of prohibitions from Great Britain:

- Aerosols.
- Ammunition
- Animals, live
- Arms and parts of arms
- Coins
- Frozen food
- Human and animal remains (cremated remains/ashes)
- Lottery tickets
- The list goes on and on

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The example, the above shows just a few of the items that are prohibited for Great Britain taken from the Individual Country Listings. It is extremely important that you review the specific country you intend to mail to – prohibited items could be returned, or confiscated at any point in the mail processing system – whether domestically or internationally.

It's always better to be safe than sorry.

Old Markings and Labels



Incorrect Procedure



Correct Procedure

One of the top reasons packages are delayed in foreign destinations, is because of the markings on the box. Be aware of reused packaging if it includes any markings that could potentially be prohibited in the mail. Sometimes that reused, sturdy box previously contained a nonmailable item. In this case, bleach can only be shipped in the United States. It cannot be shipped internationally. If you're going to re-use the box, the old markings must be completely obliterated so that nothing can be seen. It is assumed that all markings and labels on a package identify the actual content.

Resources

- Postal Explorer at: <http://pe.usps.com/>
 - Publication 52, *Prohibited, Restricted, and Perishable Mail*
 - *International Mail Manual* (IMM)
- USPS Poster 138, Keep the Mail Safe
- USPS Poster 701, Check First! (Dangerous Goods in International or APO/FPO/DPO Mail)
- UPU – list of prohibited articles found at:
 - <http://www.upu.int/en/activities/customs/list-of-prohibited-articles.html>

These reference materials are excellent resources for identifying potentially hazardous materials and determining mailability. When in doubt, contact your local mailing standards specialist or business mail entry unit.