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U.S. lithium battery regulations

Regulations applicable to shipments of lithium batteries within the United States have changed. Compliance with the new regulations is mandatory effective **February 6, 2015**.

All shippers are required to understand and comply with the applicable regulations. This guide provides general information about shipping to, from or within the U.S. and is for illustrative purposes only. Please reference regulations published by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), which may be found online at: <http://hazmat.dot.gov>.

Note: For information about shipping lithium batteries globally, please refer to regulations published by the International Air Transport Association (IATA), which may be found at: <http://www.iata.org/lithiumbatteries>.

About lithium batteries

Because lithium batteries are designed to provide high levels of power, the electrical energy in these batteries is significant, meaning that such batteries can sometimes generate a great amount of heat if short circuited. In addition, the chemical contents of these batteries may catch fire if damaged or if improperly designed or assembled. For these reasons, there are safety regulations controlling the shipment of these types of batteries. Shippers must conform to the applicable regulations published by PHMSA and/or IATA.

While all lithium batteries are classified as hazardous materials (also referred to as dangerous goods), there are exceptions for common small sizes of these batteries that simplify the rules for shipping these items. This document describes the rules for shipping these small lithium batteries. Shipments not fully regulated

as Dangerous Goods do not require a UPS Dangerous Goods contract, provided restrictions below are satisfied.

Shipping lithium batteries by air service

Regulations differ depending upon what type of lithium battery you are shipping (lithium ion or lithium metal) and whether you are shipping batteries packed without equipment, batteries packed with equipment, or batteries contained in equipment. Please see Figure 3 (Page 5) and Figure 5 (Page 7) for additional information.

Because of changes to the IATA Dangerous Goods Regulations and ICAO Technical Instructions, shipments of lithium metal batteries without equipment are limited to the UPS International Dangerous Goods (IDG) network. Please see the origins and destinations that are authorized for IDG: <http://www.ups.com/content/us/en/resources/ship/idg/information/acl.html>.

Effective July 1, 2015, only pre-approved customers are allowed to ship lithium metal batteries without equipment (UN3090) via UPS® Air services. Learn more about pre-approval: <http://www.ups.com/content/us/en/resources/ship/hazardous/responsible/lithium-battery-preapproval.html>

Several passenger and cargo airlines that UPS uses to serve some markets around the world now prohibit shipments of lithium ion batteries packaged without equipment (UN3480, shipped in accordance with Section II of IATA Packing Instruction 965) on their aircraft. As a result, some countries are no longer available as origins or destinations for these shipments, or in some cases, additional time in transit may be required. Visit ups.com for more information.

Lithium battery types

There are two major kinds of lithium batteries, both of which contain very high levels of energy:

Lithium ion (Li-ion) batteries are rechargeable.

- Sometimes called "secondary lithium batteries"
- Includes lithium polymer (Li-Po) batteries
- These batteries are often found in common electronic devices such as cell phones and laptops

Lithium metal batteries are generally non-rechargeable.

- Sometimes called "primary lithium batteries"

Note: In recent years, there have been occasional recalls of defective lithium batteries. Never send recalled lithium batteries by air; doing so can be very dangerous and may result in fines or penalties against you, the sender. In addition, UPS does not transport recycled batteries by air. UPS® services that have the potential to travel by air include: UPS Next Day Air®, UPS 2nd Day Air®, UPS Express Critical®, UPS Worldwide Express Plus®, UPS Worldwide Express®, UPS Worldwide Express Freight®, UPS Worldwide Saver® and UPS Worldwide Expedited®.



Shipping lithium batteries by ground service

Additional weight and labeling requirements now apply to ground shipments of lithium batteries in the U.S. The requirements differ depending upon what type of lithium battery you are shipping (lithium ion or lithium metal) and whether you are shipping batteries packed without equipment, batteries packed with equipment, or batteries contained in equipment. Please see Figure 4 (Page 6) and Figure 6 (Page 8) for additional information.

These requirements also apply to cross-border ground shipments from the U.S. to Canada and Mexico.

UPS® Ground service to or from Alaska, Hawaii, Puerto Rico and many small islands also must travel by aircraft for at least one flight segment. Shipments to or from these destinations are thus treated as air shipments.

General regulations and FAQs

What do the abbreviations “IATA” and “PHMSA” mean?

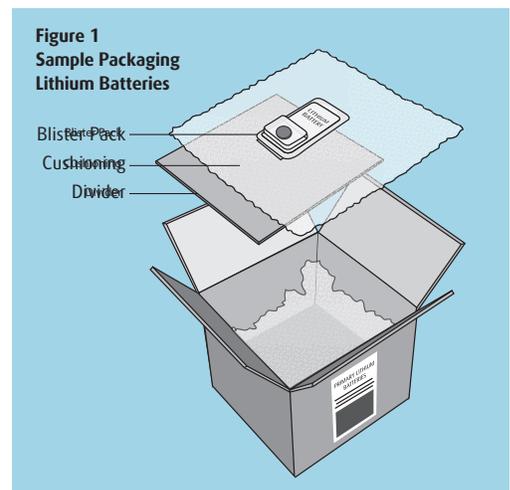
IATA is the International Air Transport Association. It is a global trade organization that develops commercial standards and publishes the *Dangerous Goods Regulations*, containing standards for the transport of dangerous goods by air. IATA's *Dangerous Goods Regulations* are based on the International Civil Aviation Organization (ICAO) *Technical Instructions for the Safe Transport of Dangerous Goods by Air*. ICAO is the United Nations body with jurisdiction over international aviation issues.

PHMSA is the Pipeline and Hazardous Materials Safety Administration of the U.S. Department of Transportation, which develops regulations for transport of dangerous goods by all modes within the U.S.

What are some ways I can help prevent a short-circuit or activation of lithium batteries in my shipment while in transport?

A major risk of shipping lithium batteries is short-circuit of a battery or inadvertent activation while in transport. All batteries should be packed to eliminate the possibility of a short-circuit or activation (see Figure 1 for an example). Ensure no batteries can come in contact with other batteries, conductive surfaces or metal objects while in transport. IATA regulations require packing cells and batteries in fully enclosed inner packaging made of non-conductive material (e.g., plastic bags) and ensuring that exposed terminals or connectors are protected with non-conductive caps or tape or by other similar means. They also recommend securely cushioning and require packing batteries to prevent shifting during transport or loosening of terminal caps. Do not use envelopes or other soft-sided packs. Please see the IATA website for additional tips and guidance:

<http://www.iata.org/lithiumbatteries>.

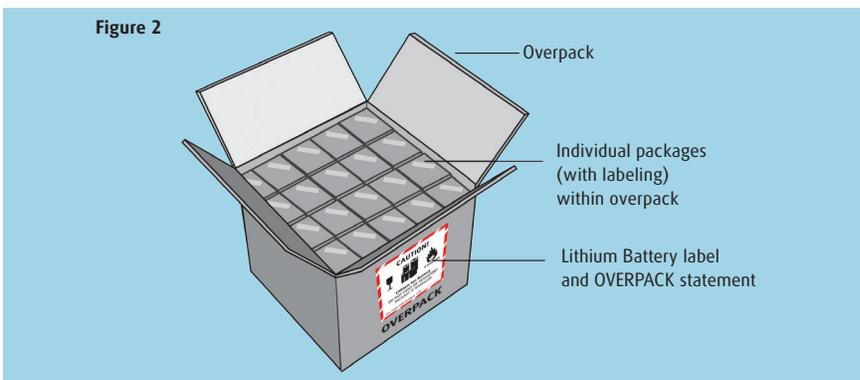




General regulations and FAQs (cont.)

Do quantity limits on cells and batteries apply to the overpacks? For the purposes of the regulation, what is considered the “package”?

An overpack may be used to consolidate several packages that have been properly prepared for shipment. Provided the individual packages are in compliance with the regulations, then at this time the limits apply only to the package(s) within the overpack. However, it is required that the individual packages comply with the necessary requirements (such as the ability to withstand a 1.2 meter drop test). The overpack must be marked with the word “overpack” and labeled with the appropriate lithium battery handling label. See Figure 2 below.



What does the abbreviation “Wh” mean?

“Wh” stands for “watt-hour.” It is a measure used to indicate the energy capacity of a lithium ion cell or battery.

What is a “button battery”?

A button battery is a small round battery where the height is less than the diameter¹ also commonly referred to as “coin batteries.” Examples can be found in watches, calculators, electronic clocks, toys and other applications.

What is a “cell” versus a “battery” under this regulation?

- A *battery* is two or more cells electrically connected together by permanent means, including case, terminals and markings.

Note: “Battery packs,” “modules” or “battery assemblies” are treated as batteries under this regulation.

- A *cell* is a single encased electrochemical unit. It has one positive and one negative electrode that exhibit a voltage differential across its two terminals.¹

Note: Many cells can be termed “battery” or “single-cell battery” in common conversation, but under this regulation a single cell must use the requirements related to “cells” only. Examples of a “cell” would be a CR123 primary lithium cell used for cameras and flashlights.

¹ Source: “IATA Lithium Battery Guidance Document: Transport of Lithium Metal and Lithium Ion Batteries.” IATA. 2014. Web. <http://www.iata.org/lithiumbatteries>



Required labels and markings

Requirements for the use of the labels and markings described on this page vary depending upon the type of battery being shipped (lithium ion or lithium metal) and how the batteries are packed (without equipment, with equipment, or contained in equipment).

See pages 5 and 7 for how and when these labels and markings must be used for air shipments, as required by U.S. DOT regulations. See pages 6 and 8 for labeling and marking requirements for ground shipments.

Required documentation

Many shipments must be accompanied by documentation (which may be affixed to a UPS® package in a document pouch) that must state the following:

- The package must be handled with care because a fire hazard exists if it is damaged
- Special procedures are to be followed if the package is damaged, to include inspection and repacking if necessary
- A telephone number for additional information

Distinctive handling label (Lithium Ion Batteries)

This label must be at least 110 mm × 120 mm and be on the outside of a



package containing lithium ion batteries. For smaller packages that can only bear smaller labels, the label dimensions may be 105 mm wide × 74 mm high.

Distinctive handling label (Lithium Metal Batteries)

This label must be at least 110 mm × 120 mm and be on the outside of a package containing lithium metal batteries. For smaller packages that can only bear smaller labels, the label dimensions may be 105 mm wide × 74 mm high.



Cargo Aircraft Only markings

If you plan to ship lithium metal batteries packed without equipment by air, the package must display the Cargo Aircraft Only label shown on this page. Ground shipments may display either of the two following statements, in letters at least 6 mm high:

**“PRIMARY LITHIUM BATTERIES—
FORBIDDEN FOR TRANSPORT
ABOARD PASSENGER AIRCRAFT”**

—or—

**“LITHIUM METAL BATTERIES—
FORBIDDEN FOR TRANSPORT
ABOARD PASSENGER AIRCRAFT”**



Note: Customers who wish to ship lithium metal batteries without equipment (UN3090) via UPS Air services must obtain pre-approval from UPS Airlines.

Labels and markings for ground shipments

Ground shipments must display a marking that identifies the presence of lithium ion or lithium metal batteries and that states the following:

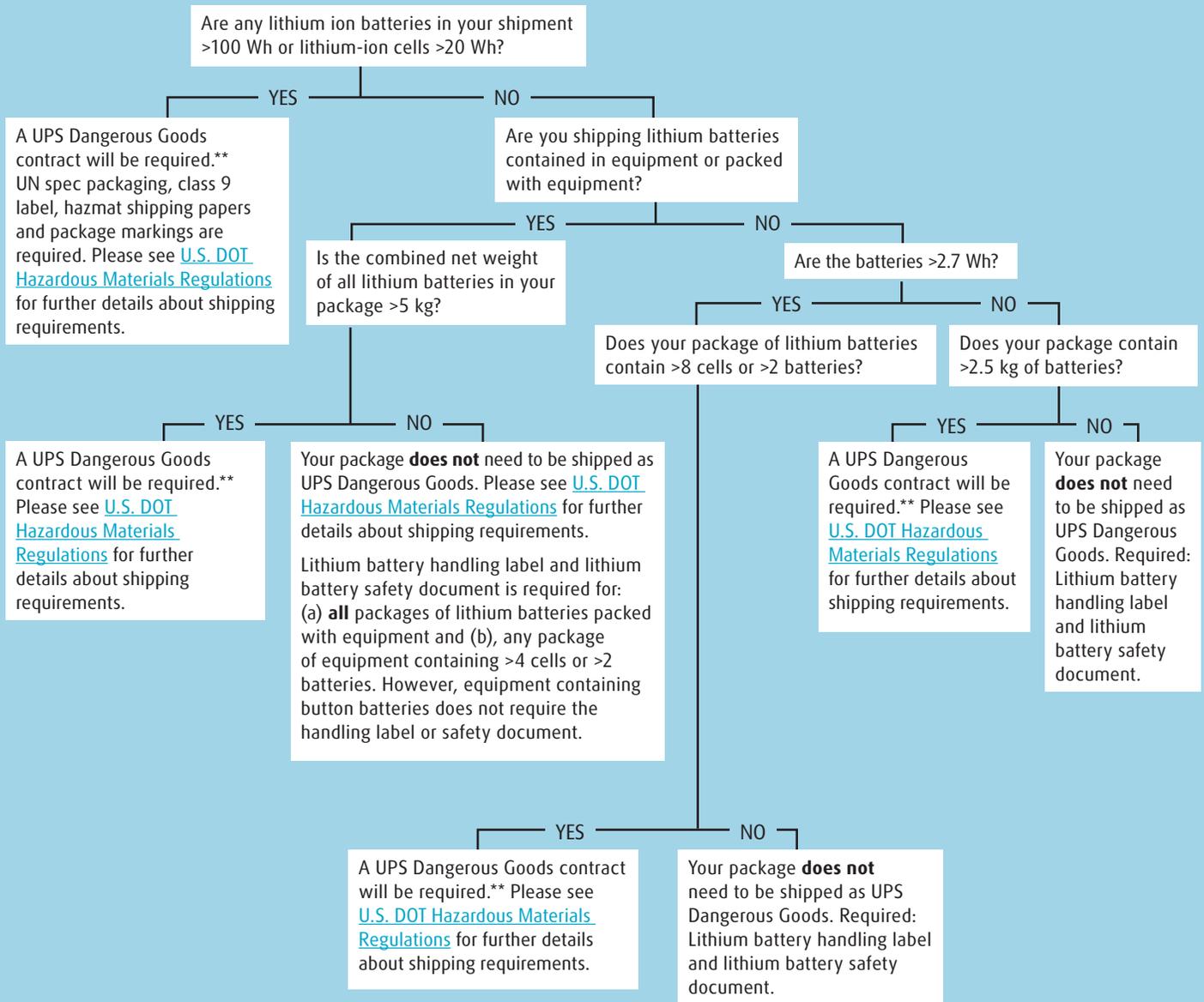
- The package must be handled with care because a fire hazard exists if it is damaged
- Special procedures are to be followed if the package is damaged, to include inspection and repacking if necessary
- A telephone number for additional information

The distinctive handling labels (shown on this page) may be used. Other stickers or markings may be used, but they must provide all the required information.



Figure 3
Air Shipments of Lithium Ion Batteries

Is my Lithium Ion Battery air shipment* fully regulated, requiring UPS® Dangerous Goods service?



*Packaging for **all** shipments of lithium batteries must be able to withstand a 1.2 meter drop test, and all batteries must be packed to eliminate the possibility of a short-circuit or activation. Do not use envelopes or any other soft-sided packs. Please see page 2 for more information. Service limitations may apply for some shipments of lithium ion batteries. Visit ups.com for more information.

**Contracts are required for UPS® Small Package and UPS Air Cargo® services but not UPS® Air Freight hazmat shipments; please contact your customer representative for details.

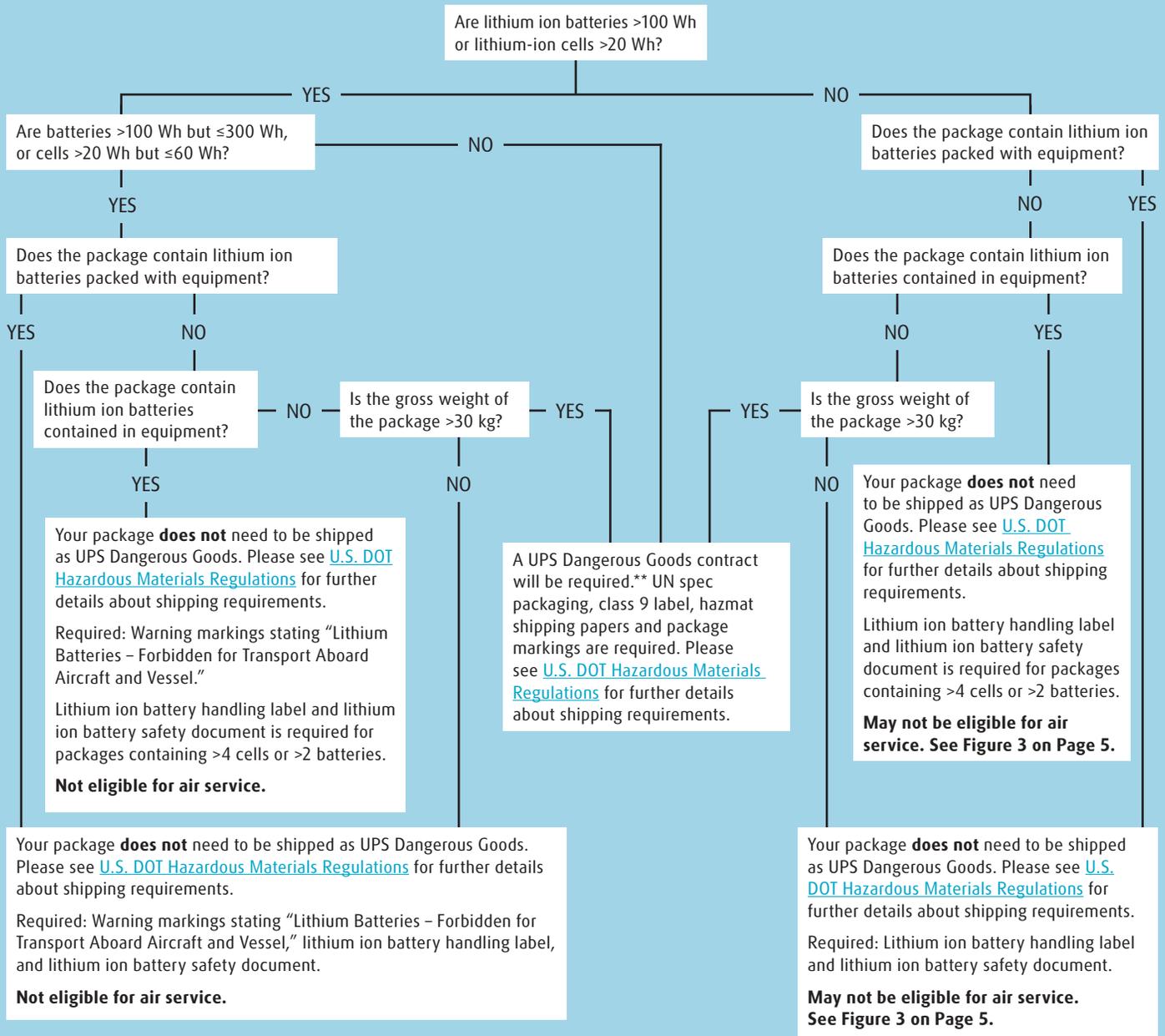


Figure 4
Ground Shipments of Lithium Ion Batteries*

Is my Lithium Ion Battery ground shipment fully regulated, requiring UPS® Dangerous Goods service?

(For detailed information about required documentation and labeling noted below, please see Page 4.)

Note: Ground shipments of lithium batteries must not be sent to any address in Alaska, Hawaii, Puerto Rico, or destinations on islands such as Avalon, CA.



*Packaging for all shipments of lithium batteries must be able to withstand a 1.2 meter drop test, and all batteries must be packed to eliminate the possibility of a short-circuit or activation. Do not use envelopes or any other soft-sided packs. Please see page 2 for more information.

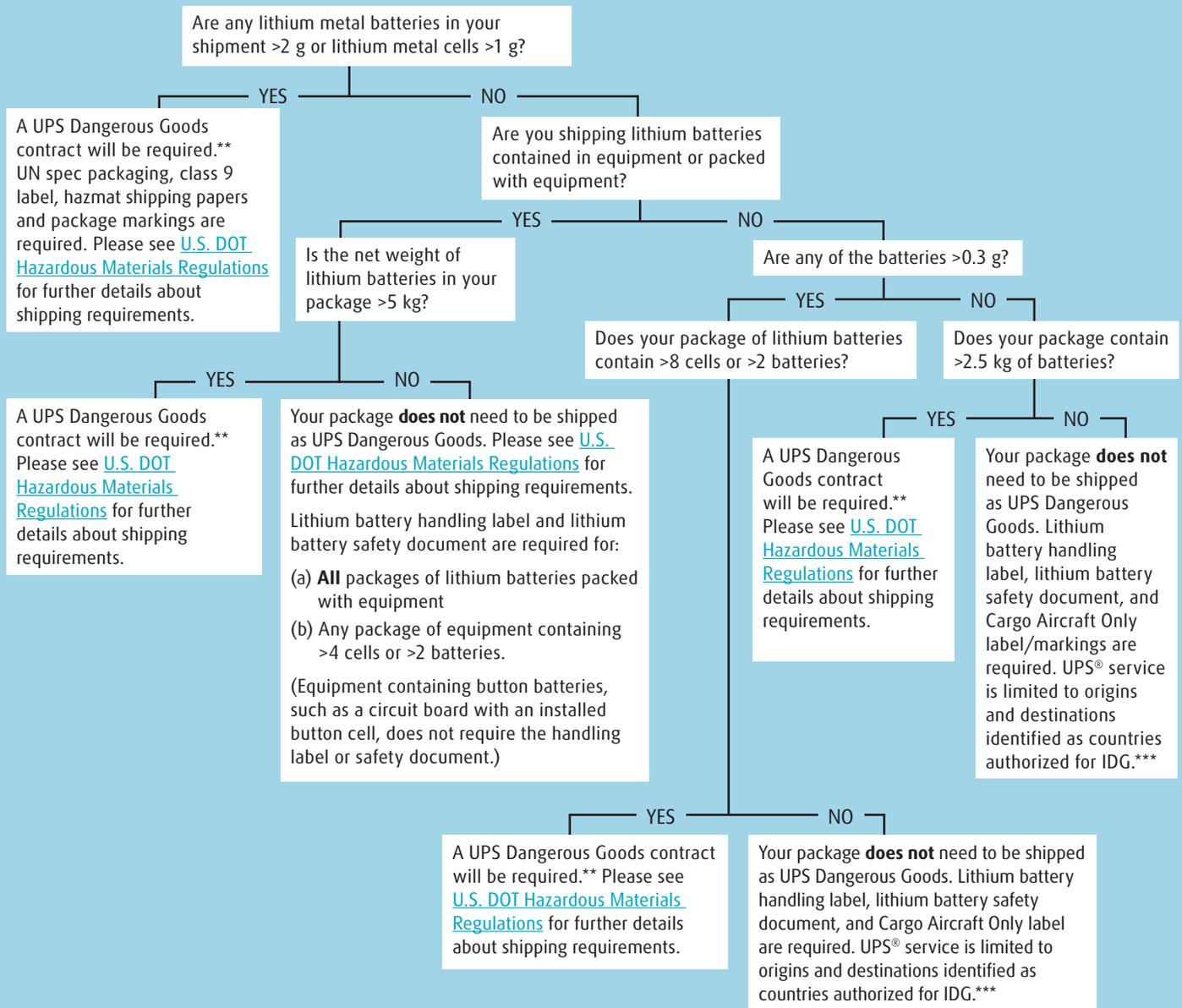
**Contracts are required for UPS® Small Package and UPS Air Cargo® services but not UPS® Air Freight hazmat shipments; please contact your customer representative for details.



**Figure 5
Air Shipments of Lithium Metal Batteries**

Is my Lithium Metal Battery air shipment* fully regulated, requiring UPS® Dangerous Goods service?

Note: Pre-approval is required to ship lithium metal batteries packed without equipment via UPS Air services. Visit ups.com for additional information.



*Packaging for all shipments of lithium batteries must be able to withstand a 1.2 meter drop test, and all batteries must be packed to eliminate the possibility of a short-circuit or activation. Do not use envelopes or any other soft-sided packs. Please see page 2 for more information. Pre-approval requirements may apply. Visit ups.com to begin the pre-approval process.

**Contracts are required for UPS® Small Package and UPS Air Cargo® services but not UPS® Air Freight hazmat shipments; please contact your customer representative for details.

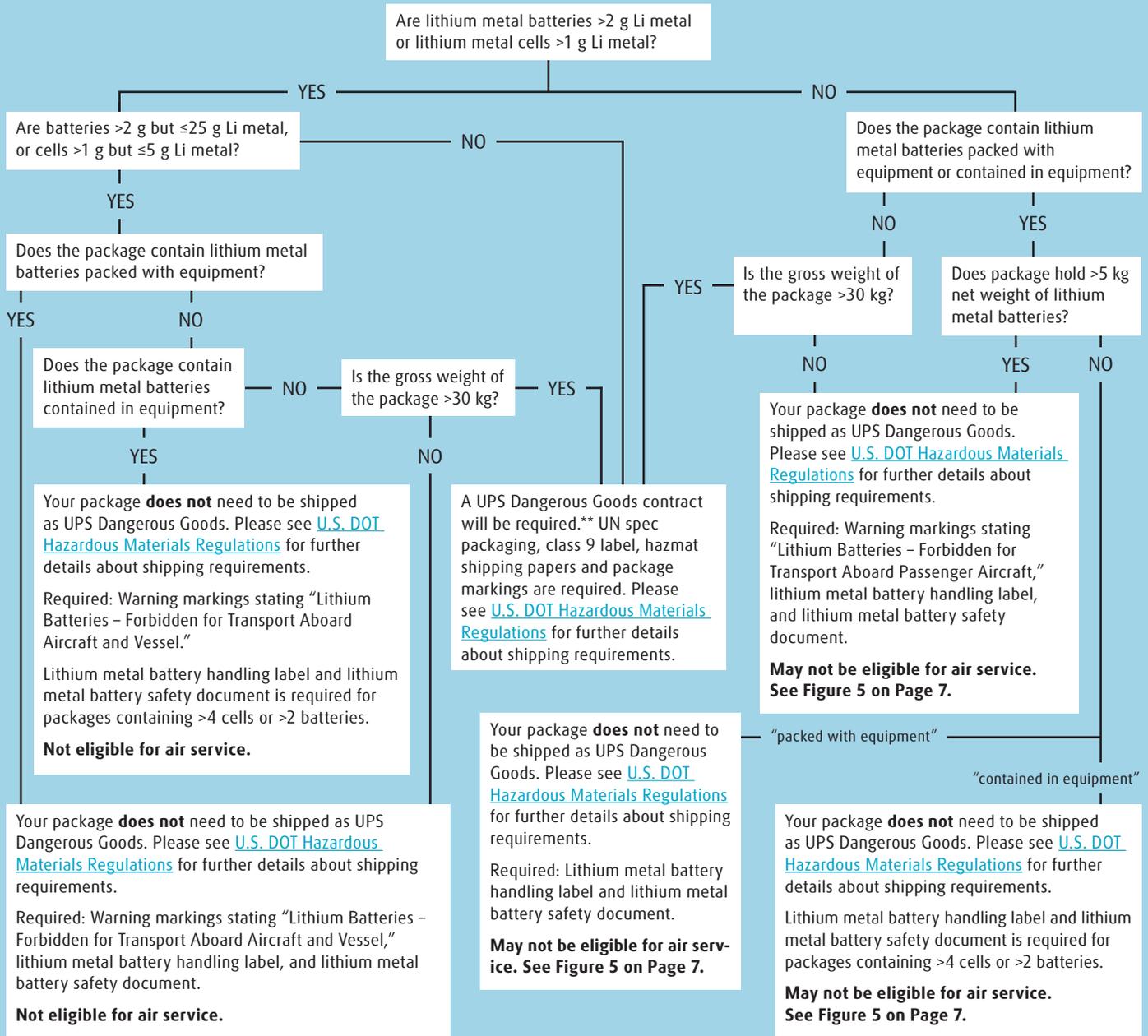
***Visit <http://www.ups.com/content/us/en/resources/ship/idg/information/acl.html> for a list of countries approved for IDG.



Figure 6
Ground Shipments of Lithium Metal Batteries*

Is my Lithium Metal Battery ground shipment fully regulated, requiring UPS® Dangerous Goods service?
(For detailed information about required documentation and labeling noted below, please see Page 4.)

Note: Ground shipments of lithium batteries must not be sent to any address in Alaska, Hawaii, Puerto Rico, or destinations on islands such as Avalon, CA.



*Packaging for all shipments of lithium batteries must be able to withstand a 1.2 meter drop test, and all batteries must be packed to eliminate the possibility of a short-circuit or activation. Do not use envelopes or any other soft-sided packs. Please see page 2 for more information.

**Contracts are required for UPS® Small Package and UPS Air Cargo® services but not UPS® Air Freight hazmat shipments; please contact your customer representative for details.