Frequently Asked Questions

We recommend you try our step-by-step tool on this page that can help you pack and ship batteries in compliance with current safety regulations. If you have any specific enquiries, please refer to the below frequently asked questions or contact our Customer Service team for further support.

1. **Following the instructions on your website, my battery type is classified as section II of UN3481, P.I.967, while the product Safety Data Sheet (SDS) shows my battery type to be section II of UN3480, P.I.965. Why is there a difference, and what should I do?**
   There could be a difference if the SDS does not take into account the various shipping configurations of the battery, for example, stand-alone, packed with equipment or contained in equipment. Differences can also exist if referencing an old SDS because the information contained in it may not reflect current regulations.

2. **What is the "state of charge" or SOC?**
   This term refers to the percentage of the electrical stored capacity in a rechargeable cell or battery (e.g. lithium ion cells or batteries) that is available for use. A fully charged lithium ion battery has a 100% state of charge (SOC). Research has demonstrated that for lithium ion batteries, reduced SOC may provide an additional level of safety during transport and reduce the likelihood of a thermal event. Effective 1 April 2016, all lithium ion batteries shipped by air without equipment must not exceed 30% SOC.

3. **What is a button battery?**
   A button battery is a small round battery where the height is less than the diameter. It is also commonly referred to as a coin battery. Examples can be found in watches, calculators, electronic clocks and toys.

4. **What is a "cell" versus a "battery"?**
   A battery is two or more cells electrically connected together by permanent means, including cases, 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 exhibits a voltage differential across its two terminals.
   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.

5. **Is a rechargeable power bank classified as lithium-ion batteries contained in equipment (UN3481) or is it classified as standalone lithium-ion batteries (UN3480)?**
   A power bank is classified as standalone lithium-ion batteries (UN3480).

6. **Is a power bank classified as a stand-alone battery?**
   Yes. IATA considers power banks to be a type of stand-alone battery, which must be classified as UN3480 (lithium ion) or UN3090 (lithium metal), as appropriate.

7. **Are AA and AAA batteries classified as dangerous goods?**
   AA and AAA indicate the physical size of a battery, not the type. It is important to know the packing instructions in order to determine if it is classified as dangerous goods. Lithium batteries are classified as dangerous goods. Please refer to the product Safety Data Sheet (SDS) or product specifications to determine the classification of the battery type.

8. **Can I ship recalled, damaged or non-conforming cells or batteries?**
   Lithium batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport by air (e.g. those being returned to the manufacturer for safety reasons). This applies also to lithium cells or batteries installed inside equipment such as mobile phones, laptops or tablets where the devices are subject to recall due to the safety concerns of the lithium cell or battery installed in the device, see Special Provision A154 in the IATA Dangerous Goods Regulations.
   Batteries which have some other defective feature (e.g. LEDs not showing charge, incorrect model number on label, or batteries not holding enough charge) could still be shipped by air. Also, laptops being returned may not have a defective battery, it may not meet the needs of the customer, may be defective itself (but not the battery), etc. In these situations air transport would be permitted. The battery or equipment manufacturer should be contacted to determine the appropriate shipping method.

9. **Can FedEx Ship Manager identify countries that can accept lithium batteries when I am checking service availability?**
   No, it cannot.

10. **Can I ship dry cell batteries? Are they classified as dangerous goods?**
    Sealed, non-vented dry-cell batteries of the type used in flashlights or for the operation of small apparatus are not generally classified as dangerous goods. They contain zinc salts and other solids, or may be of the nickel cadmium type or other combinations of metals. Such batteries must be packed in inner packaging in such a manner as to prevent short circuits and movement effectively. Examples of dry cell batteries are alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries.

11. **Can I ship wet batteries? Are they classified as dangerous goods?**
    Wet batteries are normally classified as dangerous goods because they contain corrosive acid. FedEx can transport properly prepared dangerous goods shipments from one location to another as long as FedEx is certified to handle dangerous goods at both the origin and destination locations. Please refer to the product Safety Data Sheet (SDS) or product specifications to determine the classification of the wet batteries.

12. **Can I ship an electric scooter?**
    FedEx will only accept BRAND NEW e-scooters, hover boards and other self-balancing powered vehicles from commercial manufacturers/shippers in unopened original packaging as fully regulated under “UN3171 Battery Powered Vehicles”. Such items must be marked, labelled and documented as per the IATA Dangerous Goods Regulations (DGR).

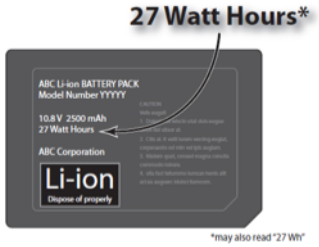
13. **Can I ship lithium polymer batteries?**
    A lithium polymer battery is a type of rechargeable lithium-ion battery. Lithium polymer batteries can be accepted to/from locations where FedEx accepts lithium-ion batteries.

14. **Why can only certain countries accept stand-alone lithium batteries?**
    Stand-alone lithium batteries are prohibited for transportation as cargo aboard passenger-carrying aircraft. They must travel aboard cargo aircraft only and not all countries have a regular cargo aircraft service to their location.

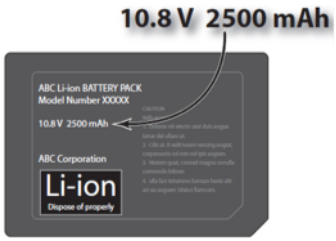
15. **Why do customers need to obtain pre-approval from FedEx to ship standalone lithium metal batteries (UN3090)?**
    Unlike lithium-ion batteries that ship with a 30% charge or less, lithium-metal batteries ship with a full charge and have the potential to cause a fire if they are not packaged properly. The pre-approval process provides an extra level of assurance that the lithium metal batteries will be suitably packaged for air transportation.

16. **How do I determine classification of my battery/battery-associated items?**
    Please consult the battery manufacturer, the product Safety Data Sheet (SDS) or product specifications.

17. **Is there a mathematical formula to calculate watt-hour measurement?**
    Yes. In some cases, you can find the watt hours on the manufacturer’s Safety Data Sheet (SDS) or on the battery itself. In the example below, the watt hours are provided by the manufacturer on the battery.



    Determining the watt-hour measurement is quite easy, but you will need a calculator. The battery shown below does not show the watt hours directly, but provides enough information to perform the calculation.



The calculation used to determine watt hours is: **Volts x ampere hour (Ah) = watt hours**
Example: "10.8 V 2500 mAh" contains the information needed to determine the watt hours for this battery.

- "10.8 V" means 10.8 Volts
- "2500 mAh" means 2500 milliampere hours. Since most batteries have low ampere-hour ratings, they are rated in milliamperes per hour (mAh), or one thousandth of an ampere hour (Ah).
- Since a milliampere hour is one thousandth of an ampere hour, divide 2500 mAH by 1,000 to get ampere hours (Ah): **2500 mAh : 1,000 = 2.5 Ampere hours**
- To determine the watt hours in this battery, multiply 10.8 volts by 2.5 ampere hours: **10.8 V x 2.5 Ah = 27 Wh**

18. **Is there a mathematical formula to calculate lithium metal content?**
If you do not have enough information to determine the lithium content of a battery, the following formulas will assist you.

Ah per cell x 0.3g x number of cells

- Many batteries are not rated in ampere hours (Ah), they are rated in milliampere hours (mAh). Milliampere hours are one thousandth of an ampere hour. To determine the Ah, divide the mAh by 1,000.
- About 0.3 grams of lithium metal is required to produce 1 ampere hour of power. For example, if the battery you wish to ship is rated at 2,500 mAh per cell and contains six cells:
    - Divide 2,500 mAh by 1,000 to get the rating in ampere hours:
      2,500 mAh ÷ 1,000 = 2.5 Ah
    - Multiple the Ah by 0.3 g to determine the amount of lithium in each cell:

      2.5 x 0.3g = 0.75 grams of lithium in each cell
    - Multiply the amount of lithium in each cell by the number of cells in each battery:
      0.75 grams/cell x 6 = 4.5 grams of lithium in the battery

19. **Which FedEx Express services can I use for UN 3090 and UN 3480 shipments?**
    You will be able to use FedEx Express service options that allow Inaccessible Dangerous Goods (IDG) shipments, and an IDG surcharge will apply.

20. **What if I'm pre-approved for the UN 3090 Section II list?**
    Customers who ship lithium metal batteries (UN3090) with FedEx must be pre-approved by FedEx Express to comply with the FedEx operator variations in IATA DG Regulations. Customers who are currently pre-approved by FedEx on the UN 3090 Section II list will automatically be placed on the UN 3090 Section I pre-approved list.

21. **What's different about dangerous goods training for staff?**
    Depending on your staff's current Dangerous Goods certification, additional training may be required. Staff who prepare any type of Section I lithium battery shipment for air transport (UN3090, UN3480, UN3091 or UN3481) will need Dangerous Goods training as detailed in subsection 1.5 of IATA Dangerous Goods Regulations, whereas staff who prepare any type of Section II lithium battery shipment for air transport need only receive adequate instruction as detailed in subsection 1.6 of the IATA DG Regulations. Your local Civil Aviation Authority can provide further information and clarification on the training requirements for shipping lithium batteries.

22. **I have multiple batteries shipping together. Should the power rating (Wh's) or lithium content be added together?**
    No, the power rating or lithium content of a multiple cells/batteries shipment should not be added together. Only the cell/ battery with the highest power rating or lithium content should be used to identify the packing instructions for your shipment.

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