

LiPo Battery Basics 2 - Transporting



LiPo Battery Basics

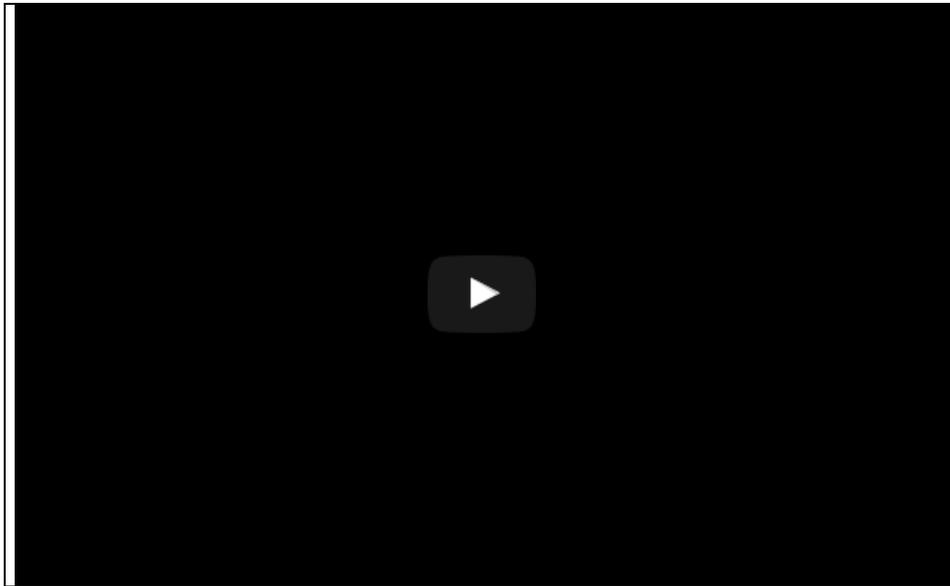
Transporting your batteries

Transporting your batteries.

Article by Tony Stillman.

Video and photos by Chad Budreau and Matt Ruddick.

Read the full article in the August 2015 issue of Model Aviation.



Lithium batteries have been around for quite some time. They seem to be everywhere—in virtually all portable electronic devices such as cell phones, tablets, and laptops. Many of today's electric-powered tools fit into this category as well.

You've probably read about or watched videos of LiPo batteries that caused fires because of damage or improper charging or incorrect use. These items can cause serious damage and injury if not handled using appropriate safety precautions.

Even some of the newest airliners have been equipped with these powerful batteries, some with not-so-good results! According to recent reports, in the Boeing 787 Dreamliner's first year of service, at least four aircraft have suffered from electrical system problems stemming from its lithium-ion batteries.

The National Transportation Safety Board (NTSB) released a report on December 1, 2014, and assigned blame to several groups:

- GS Yuasa of Japan for battery manufacturing methods that could introduce defects not caught by inspection
- Boeing's engineers who failed to consider and test for worst-case battery failures
- The FAA, which failed to recognize the potential hazard and did not require proper tests as part of its certification process

As a result, the FAA has directed the Transportation Security Administration (TSA) to look into the lithium battery situation and how they are being transported from the manufacturer to the importer, to the retailer, and then to the public. Once in the hands of the consumer, the TSA is looking into how these batteries continue to be transported as we travel with our electric-powered models onboard aircraft.

Let's first take a look at the FAA's policies for transportation of lithium-based batteries. The following is an excerpt from the FAA's Security and Hazardous Materials Safety website:

FAA Security and Hazardous Materials Safety

Our Specialists implement the Hazardous Materials Compliance and Enforcement program by conducting shipper assessments and inspections. The Joint Office's goal is to "Prevent fatalities resulting from improperly shipped hazardous materials in the United States and on U.S. Air carriers abroad." To accomplish this, the Hazardous Materials Branch is working more efficiently and collaborating with the shipper industry. The Hazardous Materials Branch targets its compliance and enforcement efforts by identifying those areas that create the greatest dangers for airplanes.

We also conduct Outreach to educate the various air operators, shippers and the public regarding the safe transportation of hazardous materials by air. The FAA Office of Security and Hazardous Materials Safety (ASH) wants to ensure that the public and industry are better informed and have designed our outreach efforts to accomplish this goal.

FAA's Office of Hazardous Materials Safety strives to increase safety in air transportation by preventing hazardous materials accidents and incidents aboard aircraft. Over 100 special agents dedicated to enforcement and educational outreach, ensure compliance with U.S. Department of Transportation (DOT) regulations.

Hazardous materials (a.k.a dangerous goods) sent using commercial transportation must comply with Hazardous Materials Regulations, 49 CFR Parts 171-179. These regulations apply to those who offer, accept, or carry hazardous materials to, from, within, and across the United States.

FAA's special agents conduct inspections and investigations of those who

- Offer hazardous materials for air transportation (the shippers)
- Accept and transport the hazardous materials (the air carriers)
- Compliance and Enforcement

Agencies that handle hazardous materials shipments for shippers or carriers, such as freight forwarders and repair stations, are subject to the Hazardous Materials Regulations and FAA inspection. Because these regulations apply to the aircraft cabin as well as the cargo hold, passengers and their baggage are also subject to these rules and FAA jurisdiction.

FAA Special Agents inspect U.S.-registered air carriers (certificate holders) for compliance with FAA hazardous materials training requirements found in 14 CFR Part 121 and Part 135. Air carriers in the U.S. cannot carry hazardous materials as cargo until they have an FAA-approved hazardous materials training program. The FAA principal operations inspector assigned to the carrier coordinates this approval.

How It Affects Us

Obviously, packing up the car and driving is a good way to avoid any hassles, but for other transportation modes, taking proper precautions and ensuring that the packs are properly stored is a must. Transporting lithium batteries must be done by a certified carrier that has been trained on packaging requirements for these batteries. As a result, all packages will have a label marking them as hazardous materials and noting that there are lithium batteries inside.

But what about jumping on an airline with your favorite model as a carry-on? Are you traveling to an international location as part of an AMA competition team to attend and participate in an international event or World Championship? Perhaps you are just visiting friends

and want to fly your model while you're there. There are some new rules and requirements that are now in place by the TSA and the FAA that we must now abide by.

AMA spoke with Michael D. Givens of the FAA Hazardous Materials Division. Michael provided information about transporting our model batteries. These batteries can be a carry-on item brought with you on the aircraft. These rules are specific to Lithium-ion batteries (rechargeable lithium, lithium polymer, LiPo, secondary lithium).

Passengers may carry all consumer-sized lithium-ion batteries (no more than 8 grams of equivalent lithium content or 100 watt-hours [Wh] per battery). This size covers AA, AAA, cell phone, PDA, camera, camcorder, handheld game, tablet, and standard laptop computer batteries, as well as our model batteries.

The Wh rating is marked on newer lithium-ion batteries. Passengers can also bring two larger lithium-ion batteries (more than 8 and less than 25 grams of equivalent lithium content per battery or roughly 100 to 300 Wh per battery) in their carry-on. This size covers the largest aftermarket extended-life laptop batteries and most lithium-ion batteries for professional-grade audio/visual equipment and our larger model aircraft battery packs. Most lithium-ion batteries are less than this.

The bottom line is that you can carry multiple lithium batteries with you as a carry-on on an airplane. There is no limit to the number of batteries (100 Wh or less), as long the FAA believes that the amount you are carrying is "reasonable" and not for resale. However, you are limited to two batteries between 100 and 300 Wh rating.

Recently, an AMA employee was at the airport and watched several AMA members go through the TSA inspection carrying lithium batteries as a carry-on and there were no issues. The packs were in a separate bag, and it went through the x-ray machine with no questions.

Although there are new regulations in place, there are no real issues with carrying batteries with you, as long as you are not bringing extremely large packs. I recommend that you check your packs and find out if you have any that are between 100 Wh and 300 Wh and be prepared to limit yourself to only two of these when you go to the airport.

If you are going out of the country or plan to take more than two of these larger packs, you will need to send them to your final destination by cargo aircraft or surface means.[dingbat]

—Tony Stillman
fsac@modelaircraft.org

Sources

FAA
www.FAA.gov

FAA's Office of Security & Hazardous Materials Safety www.faa.gov/about/office_org/headquarters_offices/ash

FAA's Office of Hazardous Materials Safety
www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat

NTSB
www.nts.gov