

Safe battery packaging

The following FAQ regarding the DOT's governance of battery packaging is intended to educate and inform. All content contained is subject to change due to continuing rulemaking activity by US DOT PHMSA. To ensure proper compliance for your custom situation, please contact your HAZPlus® representative.



Did you know?

- 95% of all batteries manufactured in the U.S. are deemed hazardous materials by the Department of Transportation (DOT).
- Significant changes to DOT's CFR49 governing the rules and regulations for approved battery packaging have taken place; shippers can no longer operate "under the radar."
- If you are shipping or distributing batteries or equipment containing various types of batteries, you could be in violation of Hazardous Materials Regulations (HMR).

Which types of batteries are considered dangerous goods?

Most modern battery types and traditional wet cell batteries are considered hazardous materials shipments under the HMR (CFR49) with many shipments requiring specification packaging and proper documentation. There are also shipping mode restrictions to consider. While Lithium batteries are the most widely-used batteries affected by these new regulations, any battery shipment should be evaluated and classified under the definitions of the CFR 49 and any applicable

modal or international regulations. Making matters more complex, there is some measure of disharmony in the requirements of various shipping modes and international requirements, including specifically in the assignment of battery proper shipping names.

Which of the different battery types require performance oriented packaging (pop)?

- Wet cell batteries by surface and air modes, unless explicitly excepted [See: CFR 49 § 173.159].
- Lithium prototypes for UN evaluation [See: CFR 49 § 173.185(e)].
- Small runs of Lithium batteries [See: CFR 49 § 172.102, Special Provision 29].
- All Lithium batteries and equipment containing Lithium batteries by surface and air modes, unless explicitly excepted when the terms of the exceptions are followed [CFR 49 § 173.185, CFR 49 § 172.102, Special Provisions 188, 189, 190, A54, A55, A100].
- Batteries made containing sodium or hydroxides are also subject to the HMR and require specification packaging unless explicitly excepted.

What are the current CFR49 regulations pertaining to packaging lithium batteries?

Relevant packaging and classification sections of the CFR 49 pertaining to Lithium batteries, Lithium batteries, packed with equipment, and Lithium batteries, contained in equipment are found in: [CFR 49 § 173.185, CFR 49 § 172.102, Special Provisions 188, 189, 190, A54, A55, A100]

What are the hazards if lithium batteries are packaged incorrectly?

Liability of several types can be severe. External shorts can lead to dangerous evolution of heat, possible rupture or fire. Improperly packaged batteries have resulted in fires in transportation which have been known to cascade and ignite neighboring materials. Additionally, current fire suppression systems aboard airplanes are simply not equipped to suppress lithium battery fires.

What markets are affected by the more restrictive battery packaging regulations?

Battery manufacturers obviously; but also equipment manufacturers, re-shippers, distributors, retail outlets (both conventional and internet.)

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Safe battery packaging^(cont.)

When do battery shipments not require specification (UP POP) packaging?

All battery shipments considered hazardous under the HMR should be presumed to require specification (UN) packaging unless they are being offered under explicit exceptions. These exceptions to specification packaging requirements of the regulations are found in: [CFR 49 § 173.185, CFR 49 § 172.102, Special Provisions 188, 189, 190, A54, A55, A100]; but they require adherence to a set of specific requirements that must be followed, and these exceptions are currently under review for possible change under a current Notice of Proposed Rulemaking. [See: HM 224-F]

Are there different requirements based on the mode of transport?

Yes—the air mode is the most restrictive.

Non-rechargeable Lithium batteries are forbidden on passenger aircraft.

When using modes of transport normally associated with international shipments (air and water modes), the relevant international regulations must be consulted; there are inconsistencies in the international regulations that can lead to non-compliant, frustrated shipments.

What requirements are prescribed for the battery itself in order to meet the HMR specifications?

Lithium batteries, offered for shipment must be of an approved type. This requires a series of tests prescribed in the UN Manual of Tests and Criteria [known as “The Orange Book”] in Section 38.3:

1. Altitude Simulation
2. Thermal test
3. Vibration
4. Shock
5. External Short Circuit
6. Impact
7. Overcharge
8. Forced Discharge

It is the shippers’ responsibility to ascertain that the battery offered is of an approved type. [See: CFR 49 § 173.185(a)(1)]; It is important for non-manufacturers who re-offer batteries for shipment to know the status of the batteries with respect to this requirement (distributors beware!).

How can HAZPlus® provide the confidence you need when transporting lithium batteries?

- **Turn-Key Services:** We design, test and certify Performance Oriented Packaging [Specification Packaging] for hazardous material, including battery shipments.
- **Compliance Commitment:** As a packaging manufacturer with our own on-site UN/ISTA certification lab, we stand behind our efficient testing, UN certification and production quality control.
- **Choice & Flexibility:** We offer a variety of custom and stock packaging options offering the most economical alternative to suit your situation.
- **Regulatory/Packaging Expertise:** Our team of Hazardous Materials packaging specialists can answer all your questions, and guide you successfully through the maze of regulations to achieve compliance.

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