

SAFETY TRAINING



Hazardous Materials Shipping Training & Certification

FOR NON-DEPLOYED AIRBAGS & SEAT BELT PRE-TENSIONERS
LARGE FORMAT LITHIUM-ION BATTERIES

I. Identifying Hazardous Materials

A Hazardous Material (HazMat) means a substance or material, which has been determined by the Department of Transportation to be capable of posing an unreasonable risk to health, safety and property when transported in commerce and which has been designated as Hazardous Material or HazMat. The term includes hazardous substances, dangerous goods, hazardous waste, marine pollutant and elevated temperature materials as defined by Title 49 of the Code of Federal Regulations parts 171-173.

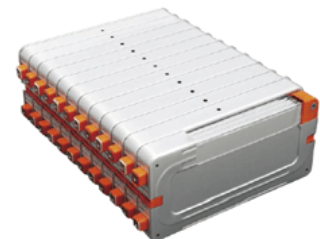
Identification of a hazardous material is the first step, and frequently the most difficult. Of all the shippers' responsibilities, the requirement to properly classify a hazardous material is very important. It is from the proper identification of the hazardous materials that the other requirements are based.

For the purpose of this training and certification program, the hazardous materials have been identified in your facilities are:

- 1) **Airbag Inflators:** Consisting of a casting containing an igniter, a booster material and a gas generate. An airbag inflator is a gas generator used to inflate an airbag in a supplemental restraint system in a motor vehicle.
- 2) **Airbag Module:** Consisting of the airbag inflator plus an inflatable airbag assembly.
- 3) **Seat belt pre-tensioner:** Contains similar hazardous materials and is used in the operation of a seat belt restraining system in a motor vehicle.
- 4) **Lithium-ion Batteries:** All types of lithium batteries were recently designated as "Dangerous Goods" with shipping restrictions. Automotive large format batteries for electric and hybrid vehicles will be either Nickel Metal Hydride or Lithium-ion batteries.

Lithium-ion batteries have higher energy densities than lead-acid batteries or nickel-metal hydride batteries. Having a high energy density means that the battery can store more electricity in the same size cell. It follows, then, that with the same amount of electricity it is possible to make the battery smaller. This is why the lithium-ion battery is ideal for being a battery on an electric vehicle, since it is compact and lightweight.

A battery with high capacity is indispensable for improving acceleration and fuel efficiency for hybrid vehicles. This hybrid Li-ion battery delivers twice the power compared to similarly sized conventional cells. As the output of the battery increases, so too does the acceleration. It also more efficiently stores energy during deceleration, further improving fuel efficiency.



Most batteries are considered hazardous materials (also called dangerous goods,) and are subject to regulations issued by the DOT and International Civil Aviation Organization (ICAO). The U.S.

DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) works to ensure the safe transportation of hazardous materials – including batteries – shipped by highway, rail, water, or air.

BATTERY “DANGEROUS GOODS” REGULATIONS

The U.S. and international regulations pertaining to the transportation of lithium (metal) cells and batteries and lithium ion cells and batteries have changed significantly over the past five years. Tests based on UN Manual of Tests and Criteria must be performed as identified in 49 CFR 173.185 and the ICAO Technical Instructions, Packing Instruction 903, and Special Provision A45 . The regulations also apply to cells and batteries that are packed with or contained in equipment.

Most consumer-type lithium metal batteries and lithium ion batteries do not require fully regulated markings, labels, and shipping papers. However, the ICAO Technical Instructions contain limited marking, shipping paper, and packaging requirements for packaging that contain more than 12 batteries or 24 cells. Larger cells and batteries must be shipped as fully regulated hazardous materials. This means that shippers of larger cells and batteries must comply with specific labeling, marking, packaging, shipping paper, and employee training requirements.

The U.S. DOT hazardous materials regulations prohibit the transport of lithium metal batteries on passenger-carrying aircraft. In addition, the U.S. DOT requires specific markings on packaging that contain small, consumer-type lithium metal batteries (“PRIMARY LITHIUM BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”). A “cargo aircraft only” label must be placed on packaging containing larger cells and batteries that are shipped as fully regulated hazardous materials.

For more information call the Hazardous Materials Info-Line at 1-800-467-4922, visit the web site at <http://hazmat.dot.gov> or e-mail to training@hazmat.dot.gov.

II. Training is Required

The general requirements for who needs to be trained and who can train to ship hazardous materials are documented in the most current edition of 49 CFR Parts 100-185, with specific parts of the code that pertain to automotive recycling.

"No person may offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance with the rule as defined in 49 CFR 171.2(a) subpart G of Part 107 of this chapter, if applicable, and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized."

As owners, operators, employers and employees of your facility there are certain responsibilities that have to be maintained in order to ship the hazardous materials discussed.

DEFINITIONS

Federal regulations require hazardous material training for every “Hazardous Materials Employee”. The DOT requires every “Hazardous Materials Employer” to provide all the necessary information to hazardous material employees so they can perform their individual job functions in a safe and knowledgeable manner.

- 1) "Hazardous Materials Employer" is defined as persons who use their employees to transport hazardous materials or prepare hazardous materials transportation.
- 2) "Hazardous Materials Employee" is defined as a person who is employed by a Hazardous Materials Employer and who has any connection or directly affects the transportation of or the preparation for transport of hazardous material.

A Hazardous Materials Employer must be trained to certify Hazardous Materials Employees or provide certification training to those employees responsible for preparing hazardous materials for shipping. The required areas of training include:

General awareness/familiarization: General awareness and familiarization training is intended to raise the hazmat employees' awareness of the regulation and the purpose and meaning of the hazard communication requirements. All hazmat employees must have this training. General awareness and familiarization training basically means making sure HazMat Employees can identify and recognize that the airbag/modules, seat belt pre-tensioners and Li-ion batteries are hazardous.

Function-specific training: Function specific training is intended to teach the necessary knowledge, skills and abilities for an individual's job function. Function specific training means that designated HazMat Employees have been trained to prepare materials for shipment.

Safety training: This training provides information concerning the hazards posed by materials in the workplace and personal protection measures. The training may include basic emergency response procedures but is not intended to satisfy the requirements of OSHA (29 CFR 1910.120).

Security Training: Each hazmat employee must receive security awareness training of security risks associated with hazardous materials transportation and methods designed to enhance transportation security *for facilities with large quantities being shipped*.

Hazmat employees must receive this training and certification at least once every three years. DOT regulations require that HazMat Employers train, test, and maintain test records for all HazMat Employees in these areas. A new hazmat employee who changes job functions may perform those functions prior to completion of training, provided the employee performs those functions under the direct supervision of a properly trained and knowledgeable hazmat employee; and the training is completed within 90 days after employment or job function. The training documentation must include the HazMat Employees name, completion date and location of training, name and address of the trainer, and a copy of the test and certificate.

At the end of this training session, you will take a test that will certify you to not only ship Hazardous Materials but will also enable you to train other employees to be "Hazardous Material Employees" at your facility.

III. Preparing Hazardous Material for Shipping

General requirements for shipping airbags modules or seat belt pre-tensioners are that they must be prepared for shipment in a very specific manner. They must be shipped in what is referred to as “performance UN packaging”. Also there are terms and numbers that must be printed on the shipping papers, shipping boxes, or both. HazMat shipping papers provide information on several things including; shipper/receiver name and address, HazMat description, DOT proper shipping name, quantity, emergency response information and certification and signature. If you ship or deliver HazMat in your own vehicle, such your own pick-up truck or delivery van, then you must comply 100% with these regulations. Under this scenario no placards are required on the vehicle.

HAZMAT DESCRIPTION

Hazardous Class or Division: Refers to the category of hazard assigned to a hazardous material under the definitional criteria of part 173 of the CFR. **Air bag modules, air bag inflators and seatbelt pre-tensioners can be classified as Class 9 or 2.2 Hazardous Materials** depending on the ignitor material. **Lithium-ion batteries can be classified as Class 9.**

Pyrotechnic Air bag modules air bag inflators, and seat-belt pre-tensioners, are CLASSIFIED as CLASS 9 MISCELLANEOUS HAZARDOUS MATERIALS.

Compressed gas Air bag modules, air bag inflators, and seat-belt pre-tensioners are CLASSIFIED as DIVISION 2.2 NON-FLAMMABLE COMPRESSED GAS HAZARDOUS MATERIALS.

Lithium-ion batteries are CLASSIFIED as CLASS 9 MISCELLANEOUS HAZARDOUS MATERIALS.

UN Number: UN stands for United Nations. The UN number contains 4 digits and refers to packaging conforming to standards in the United Nation Recommendations on the Transport of Dangerous Goods. **For Class 9 airbag modules and seat-belt pre-tensioners the UN Number is UN3268. For 2.2 Hazardous materials the UN Number is UN3353. Lithium Battery the UN NUMBER is UN3480.**

Packaging Groups: A grouping according to the degree of danger presented by hazardous materials. Packaging Group I indicates great danger, while Packaging Group II indicates medium danger. Packaging Group III indicates minor danger. **For air bag modules and seat-belt pre-tensioners are PACKAGING GROUP III. Lithium batteries are PACKING GROUP II.**

EX Number or Product Code: When offered for domestic transportation by highway, rail freight, cargo vessel or cargo aircraft only, a serviceable airbag module or seat-belt pre-tensioner that has been removed from a motor vehicle and manufactured as required for use in the US may be offered for transportation without marking the EX Number or product code on the shipping paper. Instead, the word "Recycled" must be entered on the shipping paper.

DOT Proper Shipping Name: The official name that DOT has determined must be written exactly.

For Recycled Class 9 HazMat, the entry on a shipping paper should look like this:

Air bag modules, 9, UN3268, III, Recycled, 5 lbs
Air bag inflators, 9, UN3268, III, Recycled, 5lbs
Seat-belt pretensioners, 9, UN3268, III, Recycled, 5 lbs

For Recycled Class 2.2 HazMat, the entry on a shipping paper should look like this:

Air bag modules, compressed, 2.2, UN3353, III, Recycled, 5lbs
Air bag inflators, compressed, 2.2, UN3353, III, Recycled, 5 lbs
Seat-belt pretensioners, compressed, 2.2, UN3353, III, Recycled, 5 lbs

For Recycled Class 9 Lithium-ion batteries, the entry on a shipping paper should look like this:

Li-ion Battery, 9, UN3480, II, Recycled, xxx lbs

24-Hour Response Telephone Number: Any person or company that ships a hazardous material must provide a 24-hour emergency response telephone number including area code; in case the transportation company has an emergency involving the hazardous material that was shipped. There are businesses that provide these services for a fee. The following is one such business:

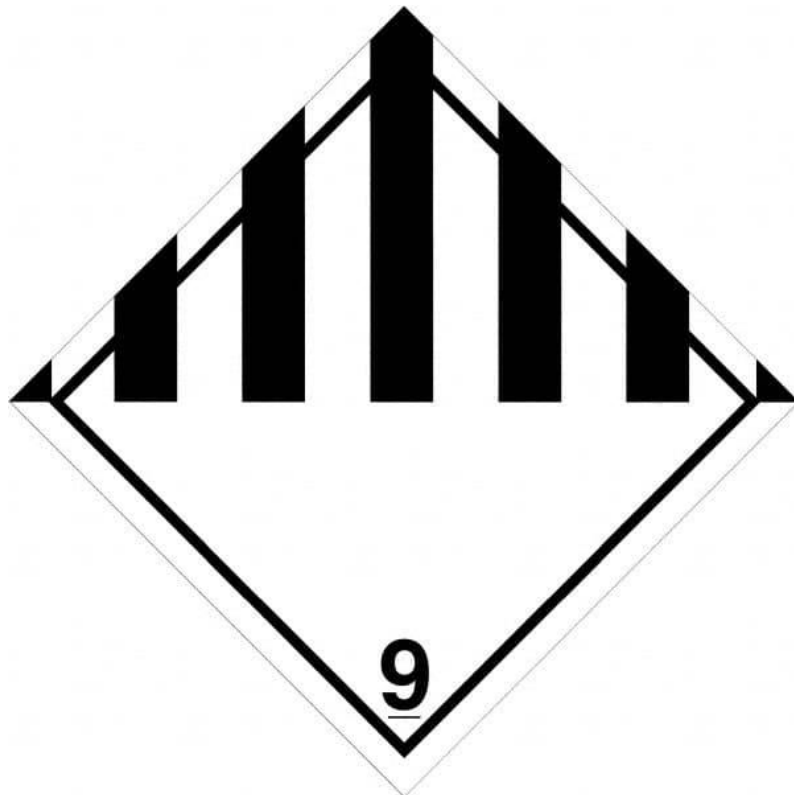
INFOTRAC I -800-535-5053

Retention of Shipping Papers: Shippers and carriers are required to retain shipping papers or electronic images thereof for a period of one (1) year to be accessible through their respective principal places of business.

Battery Transport Document for Lithium Ion Vehicle Battery

Li-ion Battery, 9, UN3480, II, Recycled, _____ lbs





BOX or CONTAINER REQUIREMENTS

In order to ship airbag modules or seat-belt pre-tensioners, UN specification packaging must be used. The UN specification marking must not be covered by labels or attachments, such as packing slips or tape.

- 1) **Strength:** The packaging that is needed is a 4G fiberboard box. Regular cardboard boxes will not work.
- 2) **Dunnage:** This refers to the cushioning that must be inside the box surrounding the hazardous material. It must be sufficient enough to secure the material to prevent movement during transportation.
- 3) **Weight:** The total of the package cannot exceed the weight allowed on a UN specification package. Only one (1) airbag module or one (1) seat-belt pre-tensioner per box is allowed.

4) **Labeling:** Hazardous materials markings must meet the following qualifications. It must be durable, in English and printed on or affixed to the surface of a package or on a label, tag or sign. It must be on a background of sharply contrasting color. It must not be covered by labels or attachments; such as packing slips or tape. And it must be located away from any other markings such as advertising that could substantially reduce its effectiveness.



Some Safe Packaging Practices for Lithium Metal Batteries and Lithium ion Batteries:

Be packaged in combination packagings conforming Packing Group II performance level. The lithium battery or cell must be packed in inner packagings in such a manner as to prevent short circuits, including movement which could lead to short circuits. The inner packaging must be packed within one of the following outer packagings: ~~metal boxes (4A or 4B)~~; wooden boxes (4C1, 4C2, 4D, or 4F); fiberboard boxes (4G); solid plastic boxes (4H2); fiber drums (1G); ~~metal drums (1A2 or 1B2)~~; plywood drums (1D); plastic jerricans (3H2); ~~or metal jerricans (3A2 or 3B2)~~. AND be equipped with an effective means of preventing external short circuits.

Cells and batteries, for disposal or recycling. A lithium cell or battery offered for transportation or transported by motor vehicle to a permitted storage facility, disposal site or for purposes of recycling is exempted from the specification packaging requirements when protected against short circuits and packed in a strong outer packaging conforming to the general packaging requirements.

Batteries employing a strong, impact-resistant outer casing and exceeding a gross weight of 12 kg (26.5 lbs.), and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (for example, in fully enclosed wooden slatted crates) or on pallets. Batteries must be secured to prevent inadvertent movement, and the terminals may not support the weight of other superimposed elements. Batteries packaged in this manner are not permitted for transportation by passenger aircraft, and may be transported by cargo aircraft only if approved by the Associate Administrator prior to transportation.

Contact the hazardous materials or dangerous goods office of the carrier you plan to use, such as UPS, FedEx, or DHL. Certain carriers will require you to certify that you have complied with the U.S. or international hazardous materials regulations.

IV. Penalties for Non-Compliance

Any person who knowingly violates a requirement of the Federal Hazardous Material Transportation Law is liable for a civil penalty of not more than \$32,500.00 and not less than \$250.00 for each violation. When the violation is a continuing one and involves hazardous materials or the causing of them to be shipped, each day the violation constitutes a separate offense. Any person who knowingly violates Section 171.2g of this Subchapter or willfully violates a provision of the Federal Hazardous Material Transportation Law shall be fined under Title 18, United States Code, or imprisoned for not more than five years or both.

HazMat Employee Name: _____

V. Test

1. Who or what agency decides whether a material to be shipped is hazardous?
 - a. The shipping company
 - b. The shipper
 - c. Department of Transportation

2. What are the Hazardous Material that will be shipped from your facility?
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3. Who needs to be trained?
 - a. HazMat Employee
 - b. HazMat Employer
 - c. All of the above
4. How frequent must training be documented?
 - a. Just once
 - b. Every year
 - c. Once every three (3) years
5. Who is responsible for conforming to the rules of the DOT when shipping Hazardous Materials?
 - a. Shipping company
 - b. Shipper
 - c. All of the above
6. What class of Hazardous Materials do the airbags and seat belt pre-tensioners fall into?
 - a. Class 9 only
 - b. Class 9 and Class 2.2
 - c. Class 1 only
7. What packing group do the airbags and seat belt pre-tensioners fall into?
 - a. Group I
 - b. Group II
 - c. Group III (the least hazardous group)

8. What does UN in the UN Number stand for?
 - a. United Nations
 - b. Undeclared Nations
 - c. Understood Nations

9. YES or NO: Can a package of Hazardous Materials be shipped in a regular cardboard box?
 - a. YES
 - b. NO

10. YES or NO: Does the DOT proper shipping name have to be written exactly on the shipping papers?
 - a. YES
 - b. NO

11. How long do shipping papers have to be maintained?
 - a. 1 Day
 - b. 1 Year
 - c. 3 Years

12. YES or NO: Does the 24-hour response telephone number have to be included on the shipping papers?
 - a. YES
 - b. NO

13. What areas of training must be included to be able to ship Hazardous Materials?
 - a. General Awareness Training
 - b. Function Specific Training
 - c. Safety Training and Security, if applicable
 - d. All of the above

14. YES or NO: Does training have to be documented and kept on file to be in compliance with the shipping company and DOT?
 - a. YES
 - b. NO

15. What package requirements must be maintained to ship Hazardous Materials?
 - a. 4G Fiberboard Box
 - b. Regular box with sufficient padding
 - c. Any box with proper labeling

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