

Lithium Batteries – Packing and Handling Procedure



Europe Region – Master Operation Plan

Europe Region Dangerous Goods

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Lithium Batteries – Packing and Handling Procedure

1 Overview

This procedure is to show the new requirement regarding Lithium Ion Cells, Lithium Polymer Batteries as well as Lithium Metal Alloy Cells and Batteries.

From January 01, 2009 the IATA special provision A 45 will be not longer valid. Instead of this special provision shippers must be in compliance to various packing instructions applying to certain batteries. These packing Instructions are divided into three parts. The beginning of each packing instruction attributes always to general requirements for all lithium batteries, Section 1 refers to fully regulated Lithium- Batteries and Cells and Section 2 refers to the partly exempt type of Lithium Batteries or Cells.

The legislation requires now detailed information about the lithium batteries inside the package, special packaging and information and in certain cases also a special marking of all shipments. Further on everybody involved in preparing these kinds of lithium batteries for transport must be trained in accordance to his jobs function.

2 Regulations

2.1 ICAO / IATA Regulations

2.1.1 General Packing Requirements

2.1.1.1 Packaging Quality

Dangerous goods must be packed in good quality packagings which must be strong enough to withstand the shocks and loadings normally encountered in transport, including removal from a pallet, unit load device or overpack for subsequent manual or mechanical handling. Packages must be constructed and closed as to prevent any loss of contents when prepared for transport which might be caused under normal conditions of transport, by vibration or by changes in temperature, humidity or pressure (resulting from altitude, for example). Packages (including inner packagings and receptacles) must be closed in accordance with the information provided by the manufacturer. No dangerous residue must adhere to the outside of packages during transport. These provisions apply, as appropriate, to new, reconditioned or remanufactured packagings.

Manufacturers and subsequent distributors of packagings must provide information regarding procedures to be followed (including closure instructions for inner packagings and receptacles), a description of the types and dimensions of closures (including required gaskets) and any other components needed to ensure that packages as presented for transport are capable of passing the applicable performance tests of Subsections 6.3 to 6.6 and the pressure differential requirements of 5.0.2.9, as applicable.

2.1.1.2 Direct Contact of Packagings

Parts of packagings which are in direct contact with dangerous goods:

- a. must not be affected or significantly weakened by those dangerous goods; and
- b. must not cause a dangerous effect, e.g. catalyzing a reaction or reacting with the dangerous goods.

Where necessary, they must be provided with a suitable inner coating or treatment.

2.1.1.3 Cushioning Material

Inner packagings must be packed, secured or cushioned in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the outer packaging. Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastic material, etc., must be secured in the outer packagings with suitable cushioning material. Any leakage of contents must not substantially impair the protective properties of the cushioning material or of the outer packaging.



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2.1.2 Lithium Ion Cells and Lithium Polymer Batteries (UN 3480)

2.1.2.1 Packing instruction 965

This instruction applies to lithium ion or lithium polymer cells and batteries (UN 3480) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium ion cells and batteries prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General requirements

The following requirements apply to all lithium ion or lithium polymer cells and batteries:

- (a) each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- (b) cells and 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 (e.g. those being returned to the manufacturer for safety reasons);
- (c) cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.

Section II – Excepted Lithium Ion Batteries

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above:

1. for cells, the Watt-hour rating is not more than 20 Wh;
2. for batteries, Watt-hour rating is not more than 100 Wh. The Watt-hour rating must be marked on the outside of the battery case except those manufactured before 1 January 2009 which may be transported without this marking until 31 December 2010;

Cells and batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1.

Additional Requirements – Section II

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.

Each package must be capable of withstanding a 1.2 m drop test in any orientation without:

- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.

Each consignment must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium ion cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

Each package must be labelled with a lithium battery handling label (Figure 7.4.1).

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium ion batteries", "not restricted" and "PI 965" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.



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Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Overpacks – Section II

Individual packages each complying with the requirements of Section II may be placed in an overpack. The overpack may also contain packages of dangerous goods or goods not subject to these Regulations provided that there are no packages enclosing different substances which might react dangerously with each other. An overpack must be marked with the word "Overpack" and labelled with the lithium battery label (Figure 7.4.I), unless the label(s) on the package(s) inside the overpack are visible.

Combination Packaging			
		Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Lithium ion cells and batteries		10.0 kg G	10.0 kg G
Outer packaging			
Type	Drums	Jerricans	Boxes

2.1.3 Lithium Ion or Lithium Polymer Cells and Batteries packed with equipment (UN 3481)

2.1.3.1 Packing instruction 966

This instruction applies to lithium ion or lithium polymer cells and batteries packed with equipment (UN 3481) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium ion cells and batteries packed with equipment prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General requirements

The following requirements apply to all lithium ion or lithium polymer cells and batteries:

- each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- cells and 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 (e.g. those being returned to the manufacturer for safety reasons);
- cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.

Section II – Excepted Lithium Ion Cells and Batteries

Lithium ion or lithium polymer cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above.

Cells and batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1.

Lithium ion cells and batteries may be offered for transport if they meet the following:

- for cells, the Watt-hour rating is not more than 20 Wh;



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2. for batteries, Watt-hour rating is not more than 100 Wh. The Watt-hour rating must be marked on the outside of the battery case except those manufactured before 1 January 2009 which may be transported without this marking until 31 December 2010;

Additional Requirements – Section II

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.

The maximum number of batteries in each package must be the minimum number required to power the equipment plus two spares.

Each package of cells or batteries must be capable of withstanding a 1.2 m drop test in any orientation without:

- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.

Each consignment must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium ion cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

Each package must be labelled with a lithium battery handling label (Figure 7.4.I).

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium ion batteries", "not restricted" and "PI 966" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.

Outer packaging			
Type	Drums	Jerricans	Boxes

2.1.4 Lithium Ion or Lithium Polymer Cells and Batteries packed in equipment (UN 3481)

2.1.4.1 Packing instruction 967

This instruction applies to lithium ion or lithium polymer cells and batteries contained in equipment (UN 3481) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium ion cells and batteries contained in equipment prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General requirements

The following requirements apply to all lithium ion or lithium polymer cells and batteries:

- (a) each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- (b) cells and 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,



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- fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons);
- (c) cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit;
 - (d) equipment must be equipped with an effective means of preventing accidental activation;
 - (e) equipment containing batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1;
 - (f) the equipment containing the cells or batteries must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport;
 - (g) Additional requirements

Section II – Excepted Lithium Ion Cells and Batteries

Lithium ion or lithium polymer cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above.

Lithium ion or lithium polymer cells and batteries may be offered for transport if they meet the following:

1. for cells, the Watt-hour rating is not more than 20 Wh;
2. for batteries, Watt-hour rating is not more than 100 Wh. The Watt-hour rating must be marked on the outside of the battery case except those manufactured before 1 January 2009 which may be transported without this marking until 31 December 2010;

Additional Requirements – Section II

The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.

Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 7.4.I);

Each consignment with packages bearing the lithium battery handling label must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium ion cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium ion batteries", "not restricted" and "PI 967" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Overpacks – Section II

Individual packages each complying with the requirements of Section II may be placed in an overpack. The overpack may also contain packages of dangerous goods or goods not subject to these Regulations provided that there are no packages enclosing different substances which might react dangerously with each other. An overpack must be marked with the word "Overpack" and labelled with the lithium battery label (Figure 7.4.I), unless the label(s) on the package(s) inside the overpack are visible, or a label is not required.



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Outer packaging			
Type	Drums	Jerricans	Boxes

2.1.5 Lithium metal or Lithium Alloy Cells and Batteries (UN 3090)

2.1.5.1 Packing instruction 968

This instruction applies to lithium metal or lithium alloy cells and batteries (UN 3090) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium metal batteries prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General Requirements

The following requirements apply to all lithium metal or lithium alloy cells and batteries:

- each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- cells and 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 (e.g. those being returned to the manufacturer for safety reasons);
- cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.

Section II – Excepted Lithium Metal and Lithium Alloy Cells and Batteries

Lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above.

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet the following:

1. a lithium metal or lithium alloy cell, the lithium content is not more than 1 g;
2. a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;

Cells and batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1. Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Additional Requirements – Section II

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.

Each package must be capable of withstanding a 1.2 m drop test in any orientation without:

- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.

Each consignment must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium metal cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.



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Each package must be labelled with a lithium battery handling label (Figure 7.4.I);

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium metal batteries", "not restricted" and "PI 968" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Overpacks–Section II

Individual packages each complying with the requirements of Section II may be placed in an overpack. The overpack may also contain packages of dangerous goods or goods not subject to these Regulations provided that there are no packages enclosing different substances which might react dangerously with each other. An overpack must be marked with the word "Overpack" and labelled with the lithium battery label (Figure 7.4.I), unless the label(s) on the package(s) inside the overpack are visible.

Combination Packaging			
	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only	
Lithium ion cells and batteries	2.5 kg G	2.5 kg G	
Outer packaging			
Type	Drums	Jerricans	Boxes

2.1.6 Lithium metal or Lithium Alloy Cells and Batteries packed with equipment (UN 3091)

2.1.6.1 Packing instruction 969

This instruction applies to lithium metal or lithium alloy cells and batteries packed with equipment (UN 3091) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium metal batteries packed with equipment prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General Requirements

The following requirements apply to all lithium metal or lithium alloy cells and batteries:

- each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- cells and 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 (e.g. those being returned to the manufacturer for safety reasons);
- cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. Additional requirements

Section II – Excepted Lithium Metal and Lithium Alloy Cells and Batteries

Lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above.

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet the following:

- a lithium metal or lithium alloy cell, the lithium content is not more than 1 g;



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2. a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;

Cells and batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1.

Additional Requirements – Section II

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.

The maximum number of batteries in each package must be the minimum number required to power the equipment plus two spares.

Each package of cells or batteries must be capable of withstanding a 1.2 m drop test in any orientation without:

- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.

Each consignment must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium metal cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

Each package must be labelled with a lithium battery handling label (Figure 7.4.I);

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium metal batteries", "not restricted" and "PI 969" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Outer packaging			
Type	Drums	Jerricans	Boxes

2.1.7 Lithium metal or Lithium Alloy Cells and Batteries packed in equipment (UN 3091)

2.1.7.1 Packing instruction 970

This instruction applies to lithium metal or lithium alloy cells and batteries contained in equipment (UN 3091) on passenger and Cargo Aircraft Only.

The general requirements apply to all lithium metal and lithium alloy cells and batteries contained in equipment prepared for transport according to this packing instruction. Section I then applies to cells and batteries that are fully regulated for transport and assigned to Class 9; Section II contains the requirements applicable to "small" cells and batteries that when packed and labelled as described are otherwise excepted from the Regulations.

General Requirements

The following requirements apply to all lithium metal or lithium alloy cells and batteries:

- (a) each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;
- (b) cells and 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



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short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons);

- (c) cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit;
- (d) equipment must be equipped with an effective means of preventing accidental activation;
- (e) equipment containing cells or batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.0.2.12.1.
- (f) the equipment containing the cells or batteries must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport;

Section II – Excepted Lithium Metal and Lithium Alloy Cells and Batteries

Lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in this section, in addition to the General Requirements, above.

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet the following:

1. a lithium metal or lithium alloy cell, the lithium content is not more than 1 g;
2. a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;

Additional Requirements – Section II

The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.

Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 7.4.I);

Each consignment with packages bearing the lithium battery handling label must be accompanied with a document such as an air waybill with an indication that:

the package contains lithium metal cells or batteries;

- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

A Shipper's Declaration for Dangerous Goods is not required.

The words "Lithium metal batteries", "not restricted" and "PI 970" must be included in the Additional Handling Information on the air waybill, when an air waybill is used.

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

Overpacks – Section II

Individual packages each complying with the requirements of Section II may be placed in an overpack. The overpack may also contain packages of dangerous goods or goods not subject to these Regulations provided that there are no packages enclosing different substances which might react dangerously with each other. An overpack must be marked with the word "Overpack" and labelled with the lithium battery label (Figure 7.4.I), unless the label(s) on the package(s) inside the overpack are visible, or a label is not required.

Outer packaging			
Type	Drums	Jerricans	Boxes



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2.1.8 Labelling and provision of Information

2.1.8.1 ADR (European Agreement concerning the international Carriage of Dangerous Goods by Road)

Special Provision 188

Cells and batteries offered for carriage are not subject to other provisions of ADR if they meet the following:

- a) For a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and for a lithium ion cell, the Watt-hour rating is not more than 20 Wh;
- b) For a lithium metal or lithium alloy battery the aggregate lithium content is not more than 2 g, and for a lithium ion battery, the Watt-hour rating is not more than 100 Wh. Lithium ion batteries subject to this provision shall be marked with the Watt-hour rating on the outside case, except those manufactured before 1 January 2009 which may be carried in accordance with this special provision and without this marking until 31 December 2010;
- c) Each cell or battery is of the type proved to meet the requirements of each test in the *Manual of Tests and Criteria*, Part III, sub-section 38.3;
- d) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.5;
- e) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. When batteries are installed in equipment, the equipment shall be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packagings capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained;
- f) Except for packages containing no more than four cells installed in equipment or no more than two batteries installed in equipment, each package shall be marked with the following:
 - an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;
 - an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
 - an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - a telephone number for additional information;
- g) Each consignment of one or more packages marked in accordance with paragraph (f) shall be accompanied with a document including the following:
 - an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;
 - an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
 - an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - a telephone number for additional information;
- h) Except when batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
- i) Except when batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass.

As used above and elsewhere in ADR, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell. Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the carriage of these batteries for specific modes of carriage and to enable the application of different emergency response actions.



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2.1.8.2 State Variation for shipments to, from and transit through the USA (USG-02)

USG-02 In addition to the dangerous goods included in Subsection 4.2 (List of Dangerous Goods) with the word “Forbidden” shown in columns G/H, I/J and K/L and with no A1 or A2 Special Provision indicated, any material forbidden for transport by the United States' Regulations is also forbidden for transport under any circumstances to, from or within the United States (see 49 CFR 173.21 and the Hazardous Materials Table in 49 CFR 172.101).

Unless specifically authorized by the Hazardous Material Table in 49 CFR 172.101, the transport of a liquid with a vapour inhalation toxicity meeting the criteria of Division 6.1, Packing Group I or a gas meeting the criteria of Division 2.3 is forbidden for transport aboard passenger and cargo aircraft to, from or within the United States.

Primary (non-rechargeable) lithium metal batteries and cells, (UN 3090), are forbidden for transportation aboard passenger- carrying aircraft. Such batteries transported in accordance with Section I of Packing Instruction 968 must be labelled with the CARGO AIRCRAFT ONLY label. Such batteries transported in accordance with Section II of Packing Instruction 968 must be marked **“PRIMARY LITHIUM BATTERIES — FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”** or **“LITHIUM METAL BATTERIES — FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”**.

Primary (non-rechargeable) lithium metal batteries and cells contained in or packed with equipment (UN 3091) are forbidden for transportation aboard passenger- carrying aircraft unless:

1. the equipment and the batteries and cells are transported in accordance with Packing Instruction 969 or 970, as appropriate;
2. the package contains no more than the number of lithium metal batteries or cells necessary to power the intended piece of equipment;
3. the lithium content of each cell, when fully charged, is not more than 5 grams;
4. the aggregate lithium content of the anode of each battery, when fully charged, is not more than 25 grams; and
5. the net weight of lithium batteries does not exceed 5 kg (11 lb).

Primary (non-rechargeable) lithium metal batteries and cells contained in or packed with equipment (UN 3091) and transported in accordance with Section I of Packing Instruction 969 or 970 that do not conform to the above provisions are forbidden for transportation aboard passenger-carrying aircraft and must be labelled with the CARGO AIRCRAFT ONLY label.

Primary (non-rechargeable) lithium metal batteries and cells contained in or packed with equipment (UN 3091) and transported in accordance with Section II of Packing Instruction 969 or 970 that do not conform to the above provisions are forbidden for transportation aboard passenger-carrying aircraft and must be marked **“PRIMARY LITHIUM BATTERIES — FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”** or **“LITHIUM METAL BATTERIES — FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”**.

Note:

Dangerous goods that are forbidden on passenger aircraft by 49 CFR 172.101 (Column 9A) are also forbidden on passenger aircraft even when these Regulations permit such carriage. Dangerous goods that are forbidden on cargo aircraft by 49 CFR 172.101 (Column 9B) are also forbidden on cargo aircraft even when these Regulations permit such carriage.

For road transport only please ensure that the ADR Special Provision 188 will be followed.



Lithium Batteries –

Packing and Handling Procedure

3 Labelling and Documentation

Name: Lithium Battery Label

Minimum dimensions: 120 × 110 mm

Colour: The border of the label must have red diagonal hatchings. Text and symbols black on a contrasting background.



This package contains lithium cells or batteries.

Do not drop – handle with care. In the event of damage keep attention. Lithium metal cells or batteries have a flammability hazard when damaged.

Damaged lithium metal cells or batteries must not be repacked or shipped when damaged.

When there is a need of repacking due to a damaged outer package you must ensure that all Lithium ion cells or batteries inside are undamaged and they must be packed in a way that prevent any short circuit during transport

Following packing instructions **must** be followed:

- ☐ PI 965 - lithium ion or polymer cells and batteries (UN 3480)
- ☐ PI 966 - lithium ion or polymer cells and batteries packed with equipment (UN3481)
- ☐ PI 967 - lithium ion or polymer cells and batteries packed in equipment (UN 3481)
- ☐ PI 968 - lithium metal or lithium alloy cells and batteries (UN 3090)
- ☐ PI 969 - lithium metal or lithium alloy cells and batteries packed with equipment (UN3091)
- ☐ PI 970 - lithium metal or lithium alloy cells and batteries packed in equipment (UN 3091)

(please check accordingly)

For additional information please call the phone number described on the label above.



Lithium Batteries –

Packing and Handling Procedure

4 Handling

When ever packages containing lithium batteries fulfilling the exemption of part 1 of the applicable packing instructions are to be prepared for transport, it must be ensured that only staff trained and advised in accordance to this "Packing and Handling Procedure" will take over the required duties to prepare the shipment for transport.

Each single battery must be packed in inner packaging avoiding any short circuits during transport. Before the package gets closed it must be ensured that sufficient cushioning material is used to avoid any movement within the package during transport.

Only outer packages withstanding a 1.2 m drop test must be used.

Damaged or leaking batteries are forbidden to ship. If you recognize damaged package containing lithium batteries in accordance to this instruction you must repack the contents in accordance to this procedure. Ensure that the contents is undamaged and properly packed in inner packaging as required by the packing instruction.

In the unlikely event that a lithium battery catches fire leave it burning. Don't use the common fire extinguisher – it might make things worst. Follow the responder procedure in place. Separate – if possible – the fuming or burning battery from other flammable material such as packaging material etc..



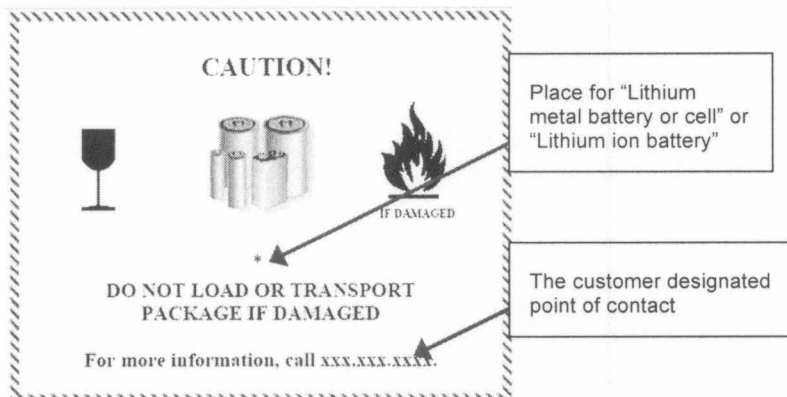
Lithium Batteries –

Packing and Handling Procedure

4.1 Lithium Batteries Job Aid

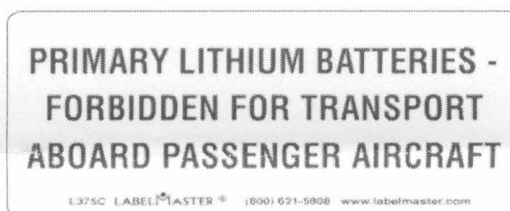
IATA has designed a new caution label for exempt (not fully regulated) Lithium Batteries as described in the applicable packing instructions.

- The new Lithium Battery Caution label is accepted in the UPS air and ground network.
- The newly created label is required for IATA prepared shipments as of January 1, 2009.

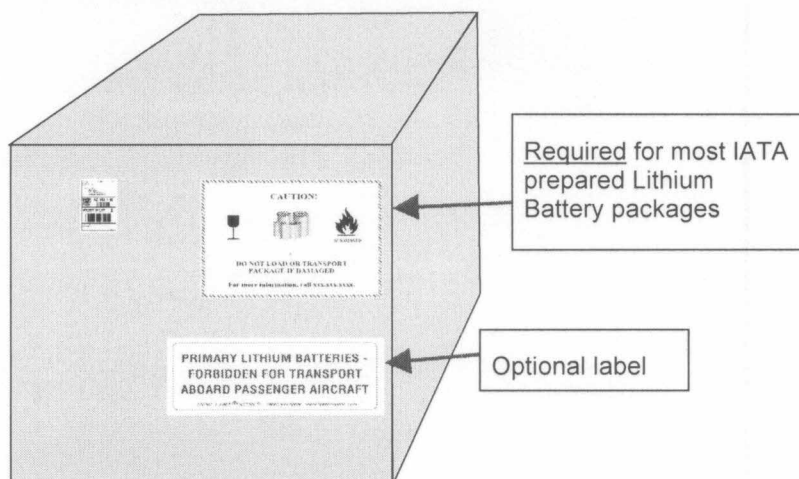


Packages bearing this label might also be marked with the DOT 49CFR marking for Primary Lithium Batteries:

- Primary Lithium Batteries – Forbidden For Transport Aboard Passenger Aircraft or Lithium Metal Batteries – Forbidden for Transport Aboard Passenger Aircraft



Example: Lithium Battery prepared Package



Note: It is acceptable for both labels to be on the package 49CFR may require this marking depending on the shipment type (batteries alone).

- IATA Shipper's Declaration for Dangerous Goods is not required
- Acceptance Audit is not required
- Acceptance sticker is not required
- NOTOC is not required



Lithium Batteries – Packing and Handling Procedure

5 Reporting

Any incident or accident regarding dangerous goods must be reported in accordance to the UPS Small Package or SCS HM10 procedure.

6 Contacts

Division Manager



Center or Branch Manager



Dangerous Goods Safety Advisor



Safety Specialist



Fire Brigade



Police



Physician



Europe Region Dangerous Goods



+49 2241 491 2050



dangerousgoods@ups.com