

Co-organizers:



Safe Transport of Lithium Battery by Air

- Present on 12 Dec 2008 -

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Best Practice 007

Acceptance of Cargo Consignment containing Lithium Cell / Battery

Background

- ✦ New changes for 50th IATA DGR
- ✦ Modification of Best Practice to cope with regulations and every changing market.



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Comply with PART 1 of packing instruction means batteries ship as "Not Restricted".

□ **PACKING INSTRUCTION 965**

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

Part 1

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of these Regulations if they meet the requirements in Part 1.

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 (e.g. those being returned to the manufacturer for safety reasons).

Lithium ion 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;
3. each cell or 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.

General requirements

Cells and batteries must be packed in strong outer packagings that conform to 5.0.2.4, 5.0.2.6.1 and 5.2.12.1.

Additional requirements

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

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.

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.I);

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

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PACKING INSTRUCTION 966 (continued)

- 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.

Comply with PART 2 of packing instruction means batteries ship as Dangerous Goods, Class 9.

OUTER PACKAGINGS

Type	Drums	Jerrycans	Boxes
Part 2			

Part 2 requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

1. Be of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3.
2. Incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits.

General requirements

The General Packing Requirements of 5.0.2 must be met.

Additional requirements

- all lithium ion cells and batteries prepared for transport as Class 9 must be protected against short circuits;
- the completed package for the cells or batteries must meet Packing Group II packaging standards;
- each completed package containing lithium cells or batteries must be marked and labelled in accordance with the applicable requirements of Section 7;
- the equipment and the packages of lithium cells or batteries must be placed in an overpack. The overpack must bear applicable marks and labels as set out in 7.1.4 and 7.2.7;
- for the purpose of this packing instruction, "equipment" means apparatus requiring the lithium batteries with which it is packed for its operation.

COMBINATION PACKAGINGS

UN number	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Quantity of lithium ion cells and batteries per overpack, excluding weight of equipment.	5.0 kg	35.0 kg

OUTER PACKAGINGS

Type	Drums	Jerrycans	Boxes

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Highlights for Part 1 of Packing Instruction

Cells / Batteries ship as “Not Restricted” Cargo

Lithium-ion Cells / Batteries (PI965 – PI967)

- For cells, the Watt-hour rating should not be more than 20Wh.
- For batteries, the Watt-hour rating should not be more than 100Wh.
 - Watt-hour rating must be marked on the outside of the battery case

Calculation of Watt-hour:

1. Wh = mAh/1000 x Volts

2. Wh = Ah x Volts

Example:

$$\text{Wh} = 5000\text{mAh}/1000 \times 7.4\text{V} \\ = 37$$



Highlights for Part 1 of Packing Instruction

Cells / Batteries ship as “Not Restricted” Cargo

Lithium Metal Cells / Batteries (PI968 – PI970)

- For cells, the lithium content should not be more than 1 g
- For batteries, the aggregate lithium content should not be more than 2g

□ PACKING INSTRUCTION 968

STATE VARIATIONS: USG-02/03

OPERATOR VARIATIONS: AM-09, BA-02, CO-10, CS-10, CZ-08, FX-10, MX-09, NW-06, SK-01, UX-07, VS-01

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

Part 1

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 Part 1.

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 (e.g. those being returned to the manufacturer for safety reasons).

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

1. A lithium metal 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;
3. Each cell or 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.

Lithium-ion or metal cells / batteries required a new handling label when shipped as “Not Restricted” cargo.

FIGURE 7.4.1
Lithium Battery Label



* Place for “Lithium ion battery” or “Lithium metal battery”, as applicable

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Document Requirement

Cells / Batteries ship as “Not Restricted” Cargo

Extract from Best Practice 007

Each consignment must be accompanied with a document signed by the shipper (name and title of the shipper must be provided) with company stamp indicating information below:

1. Indicate what kind of Lithium cells / batteries the package contains. i.e. “Lithium ion batteries”, “Lithium metal batteries”, “Lithium ion cells” or “Lithium metal cells”
2. Indicate message: “Handle with care. Flammability hazard exists if the package is damaged”

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Document Requirement

Cells / Batteries ship as “Not Restricted” Cargo

Extract from Best Practice 007

3. Indicate that Special Procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary.
4. Provide the Telephone Number for additional information.
5. Indicate which Packing Instruction has the shipment comply with. e.g. “Comply with Part 1 of PI965” or “Comply with Part 1 of PI966”, etc
6. Indicate the consignment does not contain any recalled and/or defective batteries.

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Cells / Batteries ship as Dangerous Goods, Class 9

Lithium Cells / Batteries (P1965 – PI970)

- ✦ Must pass the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3.
- ✦ Must be equipped with an effective means of preventing external short circuit and dangerous reverse current flow.

Part 2

Must comply all the rules when ship as Class 9

Part 2 Requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.

Each cell or battery must:

1. Be of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3.
2. Incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits.

Each battery containing cells or series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).

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Highlights for Part 2 of Packing Instruction

Cells / Batteries ship as Dangerous Goods, Class 9

Lithium Metal Cells / Batteries (P1968 – P1970)

- Transport as “contained in equipment”:
The quantity of lithium metal contained in piece of equipment must not exceed 12 g per cell and 500 g per battery.
- When transport on Passenger Aircraft as:
(I) only cells / batteries or;
(II) packed with equipment
Need to apply:
 - Must be packed in either a rigid metal intermediate or a metal outer packaging; and
 - Cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive.

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Document Requirement

Cells / Batteries ship as Dangerous Goods, Class 9

- ✦ **Shipper Declaration Form (DGD)**

**Shipment to be proper declared and packed,
therefore to maintain highest level of Air Safety.**

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Reduce Shipment Rejection

- **Best Practice 007 provides regulation highlights and document standard in Hong Kong**
- **Individual Carrier Requirements**

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Special Thanks:



THE END

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