

PACKING INSTRUCTION 968

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.

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 5.0.2.12.1.

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 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);

Overpacks

Individual packages each complying with the requirements of Part 1 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.

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

COMBINATION PACKAGINGS

	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Lithium metal cells and batteries	2.5 kg G	2.5 kg G

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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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.

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).

Cells with a liquid cathode containing sulphur dioxide, sulphuryl chloride or thionyl chloride which have been discharged to the extent that the open circuit voltage is less than the lower of:

- 2 volts; or
- two-thirds of the voltage of the undischarged cell;

and batteries containing one or more such cells, are forbidden for transport.

General requirements

The General Packing Requirements of 5.0.2 must be met.

Additional requirements

- all lithium metal cells and batteries prepared for transport as Class 9 must be protected against short circuits;
- packagings must meet Packing Group II performance standards;
- lithium batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings and protective enclosures not subject to the requirements of Section 6 of these Regulations, if approved by the appropriate national authority of the State of origin. A copy of the document of approval must accompany the consignment.

Lithium metal cells and batteries prepared for transport on Passenger Aircraft as Class 9:

- must be packed in either a rigid metal intermediate or a metal outer packaging;
- cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive before being placed in either the metal intermediate or metal outer packaging.

COMBINATION PACKAGINGS

	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Lithium metal cells and batteries	2.5 kg G	35 kg G

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
Desc	Steel	Alum- inium	Ply- wood	Fibre	Plastic	Steel	Alum- inium	Plastic	Steel	Alum- inium	Wood	Ply- wood	Recon- stituted wood	Fibre- board	Plastic
Spec	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H1 4H2

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.

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.

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 5.0.2.12.1.

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.

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

Each package of 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);

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

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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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.

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).

Cells with a liquid cathode containing sulphur dioxide, sulphuryl chloride or thionyl chloride which have been discharged to the extent that the open circuit voltage is less than the lower of:

- 2 volts; or
- two-thirds of the voltage of the undischarged cell;

and batteries containing one or more such cells, are forbidden for transport.

General requirements

The General Packing Requirements of 5.0.2 must be met.

Additional requirements

- all lithium metal 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;
- 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.

Lithium metal cells and batteries prepared for transport on Passenger Aircraft as Class 9:

- must be packed in either a rigid metal intermediate or a metal outer packaging;
- cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and being placed in either the metal intermediate or metal outer packaging.

COMBINATION PACKAGINGS

	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Quantity of lithium metal cells and batteries per overpack, excluding weight of equipment	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
Desc	Steel	Alum- inium	Ply- wood	Fibre	Plastic	Steel	Alum- inium	Plastic	Steel	Alum- inium	Wood	Ply- wood	Recon- stituted wood	Fibre- board	Plastic
Spec	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H1 4H2

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.

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:

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

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.

Additional requirements

The equipment must be equipped with an effective means of preventing accidental activation.

Cells and batteries must be protected so as to prevent short circuits.

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 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.

Overpacks

Individual packages each complying with the requirements of Part 1 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.

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

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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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.

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).

Cells with a liquid cathode containing sulphur dioxide, sulphuryl chloride or thionyl chloride which have been discharged to the extent that the open circuit voltage is less than the lower of:

- 2 volts; or
- two-thirds of the voltage of the undischarged cell;

and batteries containing one or more such cells, are forbidden for transport.

General requirements

The General Packing Requirements of 5.0.2 must be met.

Additional requirements

- outer packaging must be waterproof or made waterproof through the use of a liner, such as a plastic bag unless the equipment is made waterproof by nature of its construction;
- the equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport;
- the quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

COMBINATION PACKAGINGS

	Passenger aircraft	Cargo Aircraft Only
Quantity of lithium metal cells and batteries per piece of equipment	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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FIGURE 7.4.1
Lithium Battery Label



* Place for "Lithium ion battery" and/or "Lithium metal battery", as applicable

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.