


PREFACE

This 51st Edition of the IATA *Dangerous Goods Regulations* becomes effective on 1 January 2010 and replaces the 50th Edition, which must not be used after 31 December 2009 unless specifically permitted in these Regulations.

The IATA *Dangerous Goods Regulations* are published by the IATA Dangerous Goods Board pursuant to IATA Resolutions 618 and 619 and constitute a manual of industry carrier regulations to be followed by all IATA Member airlines. This edition of the IATA Regulations is based on the requirements of Annex 18 to the Convention on International Civil Aviation (Chicago, 1944) and the 2009–2010 Edition of the associated *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284—AN/905), including addenda to the 2009–2010 Technical Instructions, adopted by the Council of ICAO and published by ICAO.

Annex 18 to the Chicago Convention and the associated *Technical Instructions for the Safe Transport of Dangerous Goods by Air* are recognized as the sole authentic legal source material in the air transport of dangerous goods. Consequently, any additional or explanatory material added by IATA does not form part of the authentic text of the ICAO *Technical Instructions* and does not have the same legal force.

In developing its Regulations, IATA has drawn on its extensive experience to give special attention to the format and wording of these Regulations to make this a readily understandable and easy-to-use manual. There are certain differences between the IATA and ICAO regulations which stem from operational considerations and result in a regulatory regime which is necessarily more restrictive than the ICAO requirements. These differences are identified by the symbol  appearing in the margin. The IATA Regulations also incorporate additional material of practical assistance to users.

The IATA *Dangerous Goods Regulations* are also available in Chinese, French, German and Spanish language versions. A Japanese language edition is also produced under licence by the Japan Air Cargo Institute for Safety (JACIS).

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Dangerous Goods Regulations 51st Edition

4.2 List of Dangerous Goods

UN/ID no.	Proper Shipping Name/Description	Class or Div.	Hazard Labels	PG	Passenger and Cargo Aircraft		Cargo Aircraft Only		Spec. Prov.	ERG Code
					Pkg Inst	Max Net Qty/Pkg	Pack Inst	Max Net Qty/Pkg		
A.0	B	C	D	E	I	J	K	L	M	N
	Batteries, dry				Not Restricted	Not Restricted	Not Restricted	Not Restricted	A123	
2794	Batteries, wet, filled with acid electric storage †	8	<u>Corrosive</u>		<u>800</u>	30 kg G	<u>800</u>	No Limit	<u>A51</u> <u>A164</u>	8L
2795	Batteries, wet, filled with alkali electric storage †	8	<u>Corrosive</u>		<u>800</u>	30 kg G	<u>800</u>	No Limit	<u>A51</u> <u>A164</u>	8L
2800	Batteries, wet, non-spillable electric storage †	8	<u>Corrosive</u>		<u>806</u>	No Limit	<u>806</u>	No Limit	<u>A48</u> <u>A67</u> <u>A164</u>	8L
3090	Lithium metal batteries (including lithium alloy batteries) †	9	<u>Miscellaneous</u>	II	<u>968</u>	2.5 kg G	<u>968</u>	35 kg G	<u>A88</u> <u>A99</u> <u>A154</u> <u>A164</u>	9F
3091	Lithium metal batteries contained in equipment (including lithium alloy batteries) †	9	<u>Miscellaneous</u>	II	<u>See 970</u>	See 970	<u>See 970</u>	See 970	<u>A48</u> <u>A154</u> <u>A164</u>	9F
3091	Lithium metal batteries packed with equipment (including lithium alloy batteries) †	9	<u>Miscellaneous</u>	II	<u>See 969</u>	See 969	<u>See 969</u>	See 969	<u>A154</u> <u>A164</u>	9F
3292	Batteries, containing sodium †	4.3	<u>Dange...n Wet</u>	II	Forbidden	Forbidden	<u>433</u>	No Limit	<u>A94</u>	4W
3480	Lithium ion batteries (including lithium polymer batteries) †	9	<u>Miscellaneous</u>	II	<u>965</u>	5 kg G	<u>965</u>	35 kg G	<u>A88</u> <u>A99</u> <u>A154</u> <u>A164</u>	9F
3481	Lithium ion batteries contained in equipment (including lithium polymer batteries) †	9	<u>Miscellaneous</u>	II	<u>See 967</u>	See 967	<u>See 967</u>	See 967	<u>A48</u> <u>A154</u> <u>A164</u>	9F
3481	Lithium ion batteries packed with equipment (including lithium polymer batteries) †	9	<u>Miscellaneous</u>	II	<u>See 966</u>	See 966	<u>See 966</u>	See 966	<u>A88</u> <u>A154</u> <u>A164</u>	9F



PACKING INSTRUCTION 806

STATE VARIATIONS: [USG-11](#) [USG-13](#)

OPERATOR VARIATIONS: [AM-08](#) [CI-01](#) [LA-08](#) [MX-08](#)

This instruction applies to [UN 2800](#), Batteries, wet, non-spillable on passenger and CAO.

The General Packing Requirements of [5.0.2](#) must be met.

Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

Vibration test — The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (0.032 in) (1.6 mm [0.063 in] maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95±5 minutes for each mounting position (direction of vibration) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test — Following the vibration test, the battery is stored for six hours at 24°C±4°C (75°F±8°F) while subjected to a pressure differential of at least 88 kPa. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

Batteries must be protected against short circuits and must be securely packed in strong outer packagings.

Note:

Non-spillable type batteries which are an integral part of, and necessary for the operation of mechanical or electronic equipment, must be securely fastened in the battery holder on the equipment and protected in such a manner as to prevent damage and short circuits.



△ **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 I – Fully Regulated Class 9 Lithium Ion Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must:

1. meet the General Requirements, above;
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).

Additional Requirements – Section I

- 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 in protective enclosures. The packagings need not meet the requirements of Section [6](#) of these Regulations. The packagings must be approved by the appropriate authority of the State of origin. A copy of the document of approval must accompany the consignment.

COMBINATION PACKAGINGS

	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Lithium ion cells and batteries	5 kg G	35 kg G

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
	Steel	Aluminium	Plywood	Fibre	Plastic	Steel	Aluminium	Plastic	Steel	Aluminium	Wood	Plywood	Reconstituted wood	Fibreboard	Plastic
Spec.	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H2

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.I](#)).

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.

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 PACKAGINGS		
	Quantity per package Passenger aircraft	Quantity per package Cargo Aircraft Only
Lithium ion cells and batteries	10 kg G	10 kg G

OUTER PACKAGINGS			
Type	Drums	Jerricans	Boxes



△ **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:

- (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 I – Fully Regulated Class 9 Lithium Ion Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must

1. meet the General Requirements, above;
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).

Additional Requirements – Section I

- the cells or batteries must be placed in a packaging that meets Packing Group II performance standards;
- the equipment and the packages of 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

	Passenger aircraft	Cargo Aircraft Only
Quantity (gross weight) of lithium ion cells and batteries and packaging per overpack, excluding weight of equipment.	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
	Steel	Aluminium	Plywood	Fibre	Plastic	Steel	Aluminium	Plastic	Steel	Aluminium	Wood	Plywood	Reconstituted wood	Fibreboard	Plastic
Spec.	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H2

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:

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

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 PACKAGINGS			
Type	Drums	Jerricans	Boxes



△ 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, 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;

Section I – Fully Regulated Class 9 Lithium Ion Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must:

1. Meet the General Requirements, above;
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).

Additional Requirements – Section I

- 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;

COMBINATION PACKAGINGS		
	Passenger aircraft	Cargo Aircraft Only
Quantity (net weight) of lithium ion cells and batteries per piece of equipment	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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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 [7.4.1](#));

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 [7.4.1](#)), unless the label(s) on the package(s) inside the overpack are visible, or a label is not required.

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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△ **PACKING INSTRUCTION 968**

STATE VARIATIONS: [USG-02](#) [USG-03](#)

OPERATOR VARIATIONS: [AM-09](#) [BA-02](#) [CO-10](#) [CS-10](#) [CZ-08](#) [FX-10](#) [MX-09](#) [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.

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:

- (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 I – Fully Regulated Class 9 Lithium Metal and Lithium Alloy Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must:

1. Meet the General Requirements, above;
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.

Additional Requirements – Section I

- 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 in protective enclosures. The packagings need not meet the requirements of Section [6](#) of these Regulations. The packagings must be approved by the appropriate national authority of the State of origin. A copy of the document of approval must accompany the consignment.

Lithium metal and lithium alloy 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	Aluminium	Plywood	Fibre	Plastic	Steel	Aluminium	Plastic	Steel	Aluminium	Wood	Plywood	Reconstituted wood	Fibreboard	Plastic
Spec.	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H2

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](#).

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.

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 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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△ **PACKING INSTRUCTION 969**

STATE VARIATIONS: [USG-02](#) [USG-03](#)

OPERATOR VARIATIONS: [AM-09](#) [CO-10](#) [CS-10](#) [CZ-08](#) [MX-09](#) [SK-01](#) [VS-01](#)

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:

- (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 I – Fully Regulated Class 9 Lithium Metal Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must:

1. meet the General Requirements, above;
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.

Additional Requirements – Section I

- the cells or batteries must be placed in a packaging that meets Packing Group II performance 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 and lithium alloy 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

	Passenger aircraft	Cargo Aircraft Only
Quantity (gross weight) of lithium metal cells and batteries and packaging per overpack, excluding weight of equipment.	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
Desc.	Steel	Aluminium	Plywood	Fibre	Plastic	Steel	Aluminium	Plastic	Steel	Aluminium	Wood	Plywood	Reconstituted wood	Fibreboard	Plastic
Spec.	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H2

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](#).

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 [7.4.1](#));

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 PACKAGINGS

Type	Drums	Jerricans	Boxes
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△ PACKING INSTRUCTION 970

STATE VARIATIONS: [USG-02](#) [USG-03](#)

OPERATOR VARIATIONS: [AM-09](#) [CO-10](#) [CS-10](#) [CZ-08](#) [MX-09](#) [SK-01](#) [UX-07](#) [VS-01](#)

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 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 I – Fully Regulated Class 9 Lithium Metal and Lithium Alloy Cells and Batteries

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

The General Packing Requirements of [5.0.2](#) must be met.

Each cell or battery must:

1. meet the General Requirements, above;

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.

Additional Requirements – Section I

- 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 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 (net weight) of lithium metal cells and batteries per piece of equipment.	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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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 [7.4.1](#));

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 [7.4.1](#)), unless the label(s) on the package(s) inside the overpack are visible, or a label is not required.

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
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4.4 Special Provisions

The “Special Provisions” are referred to in Column M of the List of Dangerous Goods and the information contained therein is additional to that shown for the relevant entry. Where the wording of the special provision is equivalent to that in the UN Model Regulations the UN special provision number is shown in parentheses immediately following the air mode special provision number.

A48 Packaging tests are not considered necessary.

A67 Non-spillable batteries meeting the requirements of Packing Instruction 806 are not subject to these Regulations if, at a temperature of 55°C (131°F), the electrolyte will not flow from a ruptured or cracked case. The battery must not contain any free or unabsorbed liquid. Any electrical battery or battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be prepared for transport so as to prevent:

- (a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals); and
- (b) unintentional activation

Note:

Wheelchairs/mobility aids with gel type batteries do not require the battery to be disconnected provided the battery terminals are insulated to prevent accidental short circuits (see 2.3.2.3).

The words “Not Restricted” and the Special Provision number must be included in the description of the

A88 Prototype lithium batteries and cells to be tested that are packed with not more than 24 cells or 12 batteries per packaging that have not been tested to the requirements in subsection 38.3 of the UN Manual of Tests and Criteria may be transported aboard cargo aircraft, if approved by the appropriate authority of the State of origin and the following requirements are met:

- (a) the cells and batteries must be transported in an outer packaging that is a metal, plastic or plywood drum or a metal, plastic or wooden box and that meets the criteria for Packing Group I packagings; and
- (b) each cell and battery must be individually packed in an inner packaging inside an outer packaging and surrounded by cushioning material that is non-combustible, and non-conductive. Cells and batteries must be protected against short-circuiting.

A99 Irrespective of the limit specified in Column L of the List of Dangerous Goods (Subsection 4.2), a lithium battery or battery assembly that has

successfully passed the tests specified in the UN Manual of Tests and Criteria, Part III, subsection 38.3 and that meets the requirements of Packing Instruction 965 for lithium ion batteries, and Packing Instruction 968 for lithium metal batteries as prepared for transport may have a mass exceeding 35 kg G, if approved by the appropriate authority of the State of origin. A copy of the document of approval must accompany the consignment.

A123 This entry applies to Batteries, electric storage, not otherwise listed in Subsection 4.2 – List of Dangerous Goods. Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery or battery powered device, equipment or vehicle having the potential of a dangerous evolution of heat must be prepared for transport so as to prevent

(a) a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and

(b) accidental activation.

The words “Not Restricted” and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.

A154 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).

A164 Any electrical battery or battery powered device, equipment of vehicle having the potential of a dangerous evolution fo heat must be prepared for transport so as to prevent:

(a) a short circuit (e.g. in the case of batteries by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals); and

(b) unintentional activation.