

PACKING INSTRUCTION 965

OPERATOR VARIATIONS: 5X-07, AM-09, CI-01, US-01

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;



Note:

Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- (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) waste lithium batteries and lithium batteries being shipped for recycling or disposal are prohibited from air transport unless approved by the appropriate national authority of the State of origin and the State of the operator;
- (d) 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

- lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance standards;

PACKING INSTRUCTION 965 (continued)

- 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 or 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;
- batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

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						
Desc.	Steel	Aluminum	Plywood	Fibre	Plastic	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	Plastic
Spec.	1A2	1B2	1D	1G	1H2	3A2	3B2	3H2	4A	4B	4C1 4C2	4D	4F	4G	4H2

5
965

△ Section II—Excepted Lithium Ion Cells and Batteries

Lithium ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium ion batteries as specifically permitted may be carried in carry-on baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium ion cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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

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 then placed in a strong outer packaging.

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 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 must 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 on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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

PACKING INSTRUCTION 965 *(continued)*

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.

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

5

965
to
966

PACKING INSTRUCTION 966

OPERATOR VARIATIONS: 5X-07, AM-09, CI-01, US-01

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;



Note:

Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- (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).

PACKING INSTRUCTION 966 (continued)

Additional Requirements—Section I

- lithium ion cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance standards; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance standards.
- the equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation;
- for the purpose of this packing instruction, “equipment” means apparatus requiring the lithium batteries with which it is packed for its operation;
- batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

COMBINATION PACKAGINGS		
	Passenger aircraft	Cargo Aircraft Only
Quantity (weight) of lithium ion cells and batteries per package, excluding weight of equipment.	5 kg	35 kg

OUTER PACKAGINGS

Type	Drums					Jerricans			Boxes						
	Steel	Aluminum	Plywood	Fibre	Plastic	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	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 cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium ion batteries as specifically permitted may be carried in carry-on baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium ion cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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

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

lithium ion cells and batteries must:

- be placed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging; or
- be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a strong outer packaging.

The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

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, or the completed 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.

PACKING INSTRUCTION 966 *(continued)*

Each consignment must be accompanied with a document 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 must 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 966" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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

5

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.

966
to
967

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
------	-------	-----------	-------

PACKING INSTRUCTION 967

OPERATOR VARIATIONS: 5X-07, AM-09, US-01

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;



Note:

Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- (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;

PACKING INSTRUCTION 967 (continued)

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.

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 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;
- batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

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 — Strong outer packagings, such as:

Type	Drums						Jerricans			Boxes						
	Steel	Aluminum	Plywood	Fibre	Plastic	Other metal	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	Plastic
Desc.																

△ Section II—Excepted Lithium Ion Cells and Batteries

Lithium ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium ion batteries as specifically permitted may be carried in carry-on and checked baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium ion cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

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), except for button cell batteries installed in equipment (including circuit boards);

Each consignment with packages bearing the lithium battery handling label must be accompanied with a document 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;

PACKING INSTRUCTION 967 *(continued)*

- special procedures must 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.

△ Where a consignment includes packages bearing the lithium battery handling label, the words "Lithium ion batteries", "not restricted" and "PI 967" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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
------	-------	-----------	-------

PACKING INSTRUCTION 968

STATE VARIATIONS: USG-02/03

OPERATOR VARIATIONS: 5X-07, AM-09, BA-02, CI-01, CZ-08, FX-10, SK-01, US-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:

- 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;

△ **Note:**
Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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);
- waste lithium batteries and lithium batteries being shipped for recycling or disposal are prohibited from air transport unless approved by the appropriate national authority of the State of origin and the State of the operator;
- 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.

PACKING INSTRUCTION 968 (continued)

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

- lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the 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 or 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						
	Steel	Aluminum	Plywood	Fibre	Plastic	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	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 meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium metal batteries as specifically permitted may be carried in carry-on baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium metal or lithium alloy cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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 then placed in a strong outer packaging.

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.

PACKING INSTRUCTION 968 *(continued)*

Each consignment must be accompanied with a document 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 must 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 on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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

5

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.

968
to
969

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

PACKING INSTRUCTION 969

STATE VARIATIONS: USG-02/03

OPERATOR VARIATIONS: 5X-07, AM-09, CI-01, CZ-08, SK-01, US-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;



Note:

Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- (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.

PACKING INSTRUCTION 969 (continued)

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).

Additional Requirements—Section I

- lithium metal cells or batteries must:
 - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance standards; or
 - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance standards.
- the equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation;
- 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 (weight) of lithium metal cells and batteries per package, excluding weight of equipment.	5 kg	35 kg

OUTER PACKAGINGS																
Type	Drums					Jerricans			Boxes							
Desc.	Steel	Aluminum	Plywood	Fibre	Plastic	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	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 meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium metal batteries as specifically permitted may be carried in carry-on baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium metal or lithium alloy cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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.

PACKING INSTRUCTION 969 *(continued)*

Additional Requirements—Section II

Lithium metal cells and batteries must:

- be placed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging; or
- be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a strong outer packaging.

The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

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, or the completed 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 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 must 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 on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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.

OUTER PACKAGINGS

Type	Drums	Jerricans	Boxes
------	-------	-----------	-------

PACKING INSTRUCTION 970

STATE VARIATIONS: USG-02/03

OPERATOR VARIATIONS: 5X-07, AM-09, CI-01, CZ-08, SK-01, US-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.

PACKING INSTRUCTION 970 (continued)

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;



Note:

Batteries, including those which have been refurbished or otherwise altered, are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- (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.

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 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;
- 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 — Strong outer packagings, such as:

Type	Drums						Jerricans			Boxes						
	Steel	Aluminum	Plywood	Fibre	Plastic	Other metal	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	Plastic
Desc.	Steel	Aluminum	Plywood	Fibre	Plastic	Other metal	Steel	Aluminum	Plastic	Steel	Aluminum	Wood	Plywood	Reconstituted wood	Fibre-board	Plastic



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

Lithium metal or lithium alloy cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:

- (a) dangerous goods in passenger and crew baggage (Subsection 2.3). Only those lithium metal batteries as specifically permitted may be carried in carry-on and checked baggage;
- (b) dangerous goods in air mail (Subsection 2.4);
- (c) reporting of dangerous goods accidents, incidents and other occurrences (9.6.1 and 9.6.2).

Lithium metal or lithium alloy cells and batteries offered for transport must meet the General Requirements of this packing instruction and:

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;

PACKING INSTRUCTION 970 *(continued)*

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

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), except for button cell batteries installed in equipment (including circuit boards);

Each consignment with packages bearing the lithium battery handling label must be accompanied with a document 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 must 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.

△ Where a consignment includes packages bearing the lithium battery handling label, the words "Lithium metal batteries", "not restricted" and "PI 970" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill.

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
------	-------	-----------	-------