



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
WORKING GROUP MEETING (DGP-WG/16)**

Montreal, 17 to 21 October 2016

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)* for incorporation in the 2019-2020 Edition

2.4: Part 4 — Packing Instructions

Agenda Item 5: Specific work items identified by the Air Navigation Commission:

5.3: Mitigating risks posed by the carriage of lithium batteries by air (ANC job card DGP.003.01)

DELETION OF SECTION II PROVISIONS FOR LITHIUM ION (UN 3480) AND LITHIUM METAL (UN 3090) BATTERY SHIPMENTS

(Presented by S. Schwartz)

SUMMARY

This is a proposal to eliminate the Section II provisions in Packing Instructions 965 and 968 for **Lithium ion batteries** (UN 3480) and **Lithium metal batteries** (UN 3090).

Action by the DGP-WG: The DGP-WG is invited to consider amending Packing Instructions 965 and 968 as presented in the appendix to this working paper.

1. INTRODUCTION

1.1 In October 2010, the Federal Aviation Administration (FAA) in the United States issued a Safety Alert for Operators, alerting operators to findings by the FAA William J. Hughes Technical Center and advising them to adopt certain recommendations for the carriage of lithium batteries by air. These recommendations included having operators request that customers identify bulk shipments of currently excepted lithium batteries, and that operators load these batteries in Class C cargo compartments or in locations where alternate fire suppression was available.

1.2 In July 2015, the Boeing Company issued a Multi Operator Message, advising operators of Boeing aircraft that transport either lithium ion or lithium metal batteries to conduct a safety risk assessment. Boeing recommended that the risk assessment should consider, among other factors, the types and quantities of lithium batteries carried, the quantity of batteries per flight, the location of the batteries within the cargo compartment, and their proximity to other dangerous goods.

1.3 Also in July 2015, Airbus Industries published an In-Service Information article concerning the transport of lithium batteries aboard Airbus aircraft. Due to the limited fire suppression capabilities of cargo compartments designed to current standards in mitigating a fire involving lithium batteries, Airbus recommended that operators conduct a full risk assessment of lithium battery transport. This risk assessment should take into account the quantity and density of lithium battery shipments, the types of lithium batteries to be shipped, the likely location of pallets/containers within the cargo hold, and the capabilities of the aircraft cargo compartment in which the batteries are to be carried. Furthermore, Airbus recommended “the identification and notification of all shipments of lithium batteries (especially Section II)”, and to consider “establishing a policy to notify the flight crew of all lithium battery shipments (including exempted shipments, Section II)”.

1.4 A third ICAO multidisciplinary lithium battery meeting was held in Montreal in the last week of July, 2015. Following the conclusion of the meeting, several interim recommendations were made, including that operators perform a safety risk assessment in order to establish if they could manage the risks associated with the transport of lithium batteries as cargo on aircraft to an acceptable level of safety. In order to perform a safety risk assessment, the group concluded that information on the types and quantities of lithium batteries and cells being transported would need to be considered. Additionally, the very limited capabilities of the fire protection system in a lithium battery fire event would also need to be considered.

1.5 Section II of Packing Instructions 965 and 968 provides certain relief from the provisions of the Technical Instructions, including relief from the requirement to provide a dangerous goods transport document, the requirement to affix a Class 9 label to the package, the requirement for an acceptance check, and the requirement to notify the pilot in command of the shipment.

1.6 Due to the relief provided by Section II of the relevant packing instructions, it is not feasible for operators to determine the quantity of lithium batteries in a cargo hold or on an aircraft, nor is it feasible for operators to load Section II batteries in a cargo compartment with enhanced fire suppression capabilities. The provisions of Section II of Packing Instructions 965 and 968 make it impossible to adequately conduct the safety risk analysis recommended by Boeing, Airbus, and ICAO, and prevent operators from enacting the recommendations issued in the Safety Alert for Operators by the U.S. FAA.

1.7 Undeclared and misdeclared lithium batteries have been identified as a significant hazard in air transportation. The complexity of the lithium battery packing instructions has been noted as a contributing factor in the number of unintentionally undeclared or misdeclared shipments. Deleting the Section II provisions, and combining Section 1A and 1B would be a major simplification in the regulations and make it easier for shippers to comply with the Technical Instructions.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to amend Packing Instructions 965 and 968 for UN 3480 — **Lithium ion batteries** and UN 3090 — **Lithium metal batteries** respectively by:

- a) deleting the Section II provisions; and
- b) consolidating Sections IA and IB into a single packing instruction

as shown in the appendix to this working paper.

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APPENDIX

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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Packing Instruction 965
Cargo aircraft only for UN 3480

1. Introduction

This entry applies to lithium ion or lithium polymer batteries. ~~This packing instruction is structured as follows:~~

- ~~Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;~~
- ~~Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and~~
- ~~Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.~~

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a "cell" and must be transported according to the requirements for "cells" for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium ion cells and batteries in this packing instruction:

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 forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

~~IA. SECTION IA~~

~~3. General requirements~~

- ~~— Each cell or battery must meet all the provisions of 2;9.3.~~

~~IA.1 General requirements~~

- Part 4;1 requirements must be met.
- Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under

the written conditions established by those authorities.

Note.— *Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.*

— Net quantity per package limitations:

Table 965-IA

UN number and proper shipping name	Net quantity per package	
	Passenger	Cargo
UN 3480 Lithium ion batteries	Forbidden	35 kg

IA.24. Additional requirements

- Lithium ion cells and batteries must be protected against short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- 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 requirements.
- 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 package must be marked with the lithium battery mark (Figure 5-3) in addition to the Class 9 lithium battery hazard label (Figure 5-26).
- Lithium ion 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 (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if 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.

IA.35. Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

IB. SECTION IB

~~Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.~~

~~Lithium ion cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5.4. The packing instruction number "965" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5.4 apply.~~

~~Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2.9.3.1 a) and e) and the following:~~

- ~~1) for lithium ion cells, the Watt hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;~~
- ~~2) for lithium ion batteries, the Watt hour rating is not more than 100 Wh;~~
~~the Watt hour rating must be marked on the outside of the battery case except for those batteries~~
~~manufactured before 1 January 2009;~~

IB.1 General requirements

~~Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and~~

~~1.1.10 (except 1.1.10.1).~~

~~Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity. Cells and/or batteries at a state of charge greater than 30 per cent of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by these authorities.~~

~~Note. — Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.~~

Table 965-IB

<i>Contents</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium ion cells and batteries	Forbidden	40 kg

IB.2 Additional requirements

- ~~Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.~~
- ~~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 package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).~~
- ~~*Note. The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.*~~

IB.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II. SECTION II

- ~~Lithium ion cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:~~
 - ~~Part 1;2.3 (General — Transport of dangerous goods by post);~~
 - ~~Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);~~
 - ~~Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);~~
 - ~~Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);~~
 - ~~Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);~~
 - ~~Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and~~
 - ~~Paragraphs 1 and 2 of this packing instruction.~~
- ~~Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and the following:~~
 - ~~1) for lithium ion cells, the Watt hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;~~
 - ~~2) for lithium ion batteries, the Watt hour rating is not more than 100 Wh;~~
 - ~~the Watt hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009.~~

Packing Instruction 965

H.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Lithium ion cells and batteries must be offered for transport at a state of charge not exceeding 30 per cent of their rated capacity.

Note. Guidance and methodology for determining the rated capacity can be found in sub-section 38.3.2.3 of the UN Manual of Tests and Criteria.

Table 965-II

Contents	<i>Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh</i>	<i>Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh</i>	<i>Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh</i>
1	2	3	4
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

H.2 Additional requirements

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.

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 package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).

the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.

the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.

Note. The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.

A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.

The words "lithium ion batteries, in compliance with Section II of PI965" — cargo aircraft only" or "lithium ion batteries, in compliance with Section II of PI965 — CAO" must be placed on the air waybill, when an air waybill is used.

Packages and overpacks of lithium ion batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.

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

Packing Instruction 965

II.3 Outer packagings

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

II.4 Overpacks

~~Not more than one package prepared in accordance with this section may be placed into an overpack.~~

~~When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".~~

~~Note. For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.~~

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Packing Instruction 968

Cargo aircraft only for UN 3090

1. Introduction

This entry applies to lithium metal or lithium alloy batteries. This packing instruction is structured as follows:

— Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;

— Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and

— Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

A single cell battery as defined in Part III, sub-section 38.3.2.3 of the UN *Manual of Tests and Criteria* is considered a “cell” and must be transported according to the requirements for “cells” for the purpose of this packing instruction.

2. Lithium batteries forbidden from transport

The following applies to all lithium metal cells and batteries in this packing instruction:

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 forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. SECTION IA

3. General requirements

— Each cell or battery must meet all the provisions of 2;9.3.

IA.1 General requirements

— Part 4;1 requirements must be met.

— Net quantity per package limitations:

Table 968-IA

UN number and proper shipping name	Net quantity per package	
	Passenger	Cargo
UN 3090 Lithium metal batteries	Forbidden	35 kg

IA.24. Additional requirements

— Lithium metal cells and batteries must be protected against short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.

— 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 requirements.

— 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 package must be marked with the lithium battery handling mark (Figure 5-3) in addition to the Class 9 lithium battery hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-26).

— Lithium metal 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 (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.

IA.35. Outer packagings

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

IB. SECTION IB

~~Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968 II, are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for the provisions of Part 6.~~

~~Lithium metal cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5.4. The packing instruction number "968" required by 5.4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5.4 apply.~~

~~Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2.9.3.1 a) and e) and the following:~~

- ~~1) for lithium metal cells, the lithium content is not more than 1 g;~~
- ~~2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g.~~

IB.1 General requirements

~~Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).~~

Table 968-IB

<i>Contents</i>	<i>Net quantity per package</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium metal cells and batteries	Forbidden	2.5 kg

IB.2 Additional requirements

~~Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong rigid outer packaging.~~

~~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 package must be marked with the appropriate lithium battery mark (Figure 5-3) in addition to the appropriate Class 9 hazard label (Figure 5-26) and the cargo aircraft only label (Figure 5-28).~~

~~Note. The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5;3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.~~

Packing Instruction 968

IB.3 — Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II. SECTION II

Lithium metal or lithium alloy cells and batteries, when complying with Section II of this packing instruction, are only subject to the following additional provisions of these Instructions:

- Part 1;2.3 (General — Transport of dangerous goods by post);
- Part 5;1.1 g) and j) (Shipper's responsibilities — General requirements);
- Part 7;2.1 (Operator's responsibilities — Loading restrictions on the flight deck and for passenger aircraft);
- Part 7;2.4.1 (Operator's responsibilities — Loading of cargo aircraft);
- Part 7;4.4 (Operator's responsibilities — Reporting of dangerous goods accidents and incidents);
- Part 8;1.1 (Provisions concerning passengers and crew — Dangerous goods carried by passengers or crew); and
- Paragraphs 1 and 2 of this packing instruction.

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and the following:

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

II.1 General requirements

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-II

<i>Contents</i>	<i>Lithium metal cells and/or batteries with a lithium content not more than 0.3 g</i>	<i>Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g</i>	<i>Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.

Packing Instruction 968

II.2 Additional requirements

- ~~— Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then —
— placed in a strong rigid outer packaging.~~
- ~~— 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 package must be marked with the appropriate lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28).~~
- ~~— the package must be of such size that there is adequate space to affix the mark on one side without the mark being folded.~~
- ~~— the cargo aircraft only label must be located on the same surface of the package near the lithium battery mark, if the package dimensions are adequate.~~
- ~~— Note. — The provisions for a lithium battery handling label as contained in the 2015-2016 Edition of these Instructions (Part 5.3.5.2 and Figure 5-32 of the 2015-2016 Edition) may continue to be used in lieu of the lithium battery mark until 31 December 2018.~~
- ~~— A shipper is not permitted to offer for transport more than one package prepared according to this section in any single consignment.~~
- ~~— The words "lithium metal batteries, in compliance with Section II of PI968 — cargo aircraft only" or "lithium metal batteries, in compliance with Section II of PI968 — CAO" must be placed on the air waybill, when an air waybill is used.~~
- ~~— Packages and overpacks of lithium metal batteries prepared in accordance with the provisions of Section II must be offered to the operator separately from cargo which is not subject to these Instructions and must not be loaded into a unit load device before being offered to the operator.~~
- ~~— Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.~~

II.3 Outer packagings

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

II.4 Overpacks

- ~~— Not more than one package prepared in accordance with this section may be placed into an overpack.~~
- ~~— When the package is placed in an overpack, the lithium battery mark (Figure 5-3) and the cargo aircraft only label (Figure 5-28) required by this packing instruction must either be clearly visible or the mark and label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".~~
- ~~— Note. — For the purpose of Section II, an overpack is an enclosure used by a single shipper that contains no more than one package prepared in accordance with this section. For shipments prepared in accordance with Section IA and/or IB, this limit of one package of Section II batteries per overpack still applies.~~

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