



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)**

**TWENTY-SEVENTH MEETING**

**Montréal, 16 to 20 September 2019**

**Agenda Item 2: Managing air-specific safety risks and identifying anomalies**

**2.3: Develop proposals, if necessary, for amendments to the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284SU)* for incorporation in the 2021-2022 Edition**

**PROPOSED PACKING INSTRUCTION FOR LARGE LITHIUM BATTERIES**

(Presented by D. Brennan)

**SUMMARY**

This working paper proposes the addition into the Supplement to the Technical Instructions of a new packing instruction for lithium batteries with a net mass exceeding 35 kg that are subject to approval under Special Provision A99.

**Action by the DGP:** The DGP is invited to consider the new packing instruction proposed for the Supplement and consequential changes to the Supplement and the Technical Instructions as shown in the appendices to this working paper.

**1. INTRODUCTION**

1.1 A working paper was presented to the nineteenth working group meeting of the Dangerous Goods Panel (DGP-WG/19, Montréal, 1 to 5 April 2019) proposing revisions to the Technical Instructions and the Supplement to the Technical Instructions to include large packagings into Packing Instruction 910 (see paragraph 3.2.2.3 of the DGP-WG/19 report).

1.2 Following discussion of the working paper, a revised proposal, incorporating comments provided by panel members, was submitted in a flimsy. In the flimsy it was proposed to add a new Packing Instruction 9xx into the Supplement for large lithium batteries with a net mass exceeding 35 kg as permitted by Special Provision A99.

1.3 At DGP-WG/19 there was overall support for the revised proposal, although panel members requested more time to consult with their experts before agreeing to the proposed changes. It

was decided for DGP/27 to break the different proposals that were set out in the flimsy into separate working papers so that each part of the changes proposed could be considered separately.

1.4 This working paper proposes the addition of a new Packing Instruction 9xx for large lithium batteries. The proposed packing instruction includes provisions for large packagings as some of the large lithium batteries may have a net mass that exceeds the limit that applies to packagings, which is a gross mass of 400 kg.

1.5 To address the implementation of the new packing instruction, it is proposed to amend Special Provision A99 in the Technical Instructions to make reference to the new Packing Instruction 9xx. It also proposed to add a new special provision into the Supplement to address the use of Packing Instruction 9xx.

## 2. ACTION BY THE DGP

2.1 The DGP is invited to consider the addition of a new Packing Instruction 9xx and consequential amendments to the Technical Instructions as shown in the appendices to this working paper.

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APPENDIX A

PROPOSED AMENDMENT TO PART S-4 OF THE SUPPLEMENT TO THE TECHNICAL  
INSTRUCTIONS

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Part S-4

PACKING INSTRUCTIONS

(ADDITIONAL INFORMATION  
FOR PART 4 OF THE TECHNICAL INSTRUCTIONS)

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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Packing Instruction 9xx

Cargo aircraft only

Introduction

This packing instruction applies to UN Nos. 3090, 3091, 3480 and 3481 where the lithium battery has a mass exceeding 35 kg.

General requirements

Part 4;1 requirements of the Technical Instructions 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 unless a higher state of charge is specifically approved by the States of Origin and the Operator.

### **ADDITIONAL PACKING REQUIREMENTS**

- Packagings, including large packagings, must meet Packing Group II performance requirements.
- Cells and batteries must be protected against short circuit. Protection against short circuits includes, but is not limited to:
  - individual protection of the battery terminals;
  - inner packaging to prevent contact between cells and batteries;
  - batteries with recessed terminals designed to protect against short circuits; or
  - the use of a non-conductive and non-combustible cushioning material to fill empty space between cells or batteries in the packaging.

### **Cells and batteries, including when packed with equipment**

- 1) Batteries and cells, including equipment, of different sizes, shapes or masses must be packaged in an outer packaging of a tested design type listed below provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested. Rigid large packagings, as shown below, are permitted for a single battery, including when packed with equipment;
- 2) Appropriate measures must be taken to minimize the effects of vibration and shocks and prevent movement of the cells or batteries within the package that may lead to damage and a dangerous condition during transport. Cushioning material that is non-combustible and electrically non-conductive may be used to meet this requirement.

### **Cells and batteries contained in equipment**

- 1) Strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use. Packagings need not meet the requirements of Part 6 of the Technical Instructions;
- 2) The equipment must be constructed or packaged in such a manner as to prevent accidental operation during transport;
- 3) Large equipment can be offered for transport unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.

### **Packagings not subject to Part 6 of the Technical Instructions**

Lithium cells or batteries employing a strong, impact resistant outer casing, and assemblies of such cells or batteries may be transported unpackaged:

- 1) in strong outer packagings;
- 2) in protective enclosures (e.g. in fully enclosed or wooden slatted crates); or
- 3) on pallets or other handling devices.

Cells or batteries must be secured to prevent inadvertent movement and the terminals must not support the weight of other superimposed elements.

### **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)

**RIGID LARGE PACKAGINGS**

*Boxes*

Aluminium (50B)

Fibreboard (50G)

Natural wood (50C)

Other metal (50N)

Plastics (50H)

Plywood (50D)

Reconstituted wood (50F)

Steel (50A)

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APPENDIX B

CONSEQUENTIAL AMENDMENT TO PART 3 OF THE TECHNICAL INSTRUCTIONS

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Part 3

DANGEROUS GOODS LIST,  
SPECIAL PROVISIONS AND  
LIMITED AND EXCEPTED QUANTITIES

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Chapter 3

SPECIAL PROVISIONS

Table 3-2. Special provisions

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A99	Irrespective of the quantity limits for cargo aircraft specified in column 13 of Table 3-1, and in Section I of Packing Instructions 965, 966, 967, 968, 969 and 970, a lithium battery or battery assembly (i.e. UN 3090 or UN 3480), including when packed with equipment or contained in equipment (i.e. UN 3091 or UN 3481) that meets the other requirements of Section I of the applicable packing instruction, may have a mass exceeding 35 kg, if approved by the appropriate authority of the State of Origin and the State of the Operator <u>and the requirements in Packing Instruction 9xx of the Supplement are met</u> . A copy of the document of approval must accompany the consignment.

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