



**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**

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

**REVISIONS TO PERMITTED PACKAGINGS IN PACKING INSTRUCTION 492 & PACKING INSTRUCTIONS 870 TO 872**

(Presented by D. Brennan)

**SUMMARY**

This working paper proposes a revision to Packing Instruction 492 and Packing Instructions 870 to 872 to reflect that single packagings are permitted and to align to the packaging provisions in the UN Model Regulations.

**Action by the DGP:** The DGP is invited to consider the revisions proposed in the appendix to this working paper.

**1. INTRODUCTION**

1.1 In reviewing the packagings that are permitted for UN 3292, **Batteries, containing sodium** and **Cells, containing sodium**, it was identified that there is an inconsistency between the packagings permitted by Packing Instruction 492 in the Technical Instructions and packing instruction P408 in the UN Model Regulations.

1.2 The Technical Instructions show that single packagings are permitted for Batteries, containing sodium but that only combination packagings are permitted for Cells, containing sodium. However, as both cells and batteries are placed directly into the (outer) packaging, then technically this is not a “combination” packaging and to refer to such is misleading and confusing for users.

1.3 It was also identified that requirements in P408 in the *UN Model Regulations* for cushioning material to be provided in packagings for cells is missing from Packing Instruction 492.

1.4 When further reviewing the packing instructions for other battery types, i.e. Packing Instruction 870 for UN 2794 **Batteries, wet, filled with acid** and UN 2795 **Batteries, wet, filled with alkali**, Packing Instruction 871 for UN 3028 **Batteries, dry, containing potassium hydroxide, solid**, and Packing Instruction 872 for UN 2800 **Batteries, wet, non-spillable**, similar inconsistencies on the permission for single packagings was identified.

1.5 Additionally, during the review of the permitted outer packagings for Packing Instruction 492, it was identified that plywood drum (1D) is permitted in the UN Model Regulations but not the Technical Instructions, and this packaging should also be applicable to Packing Instruction 870.

1.6 To address these inconsistencies and provide better alignment between the Technical Instructions and the UN Model Regulations, it is proposed to revise Packing Instruction 492, and Packing Instructions 870 to 872.

## 2. ACTION BY THE DGP

2.1 The DGP is invited to consider revising Packing Instruction 492 and Packing Instructions 870 to 872 as shown in the appendix to this working paper.

---

APPENDIX

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

...

Chapter 6

CLASS 4 – FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

...

Packing Instruction 492

Passenger and cargo aircraft for UN 3292 only

...

2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS				SINGLE PACKAGINGS
UN number and proper shipping name	Packing conditions	Total quantity per package — passenger	Total quantity per package — cargo	
UN 3292 <b>Batteries, containing sodium</b>	Batteries may be offered for transport and transported unpacked or in protective enclosures such as fully enclosed or wooden slatted crates that are not subject to the requirements of Part 6 of these Instructions.	Forbidden	No limit	No limit
UN 3292 <b>Cells, containing sodium</b>	<u>There must be sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging and to ensure that no dangerous movement of the cells within the outer packaging occurs in transport.</u>	25 kg G	No limit	No

**ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS**

- Packagings must meet the Packing Group II performance requirements.
- **C**ells and **B**batteries must be protected against short circuit and must be isolated in such a manner as to prevent short circuits.

**OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6.3.1)***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)

...

## Chapter 10

## CLASS 8 — CORROSIVE SUBSTANCES

...

## Packing Instruction 870

Passenger and cargo aircraft for UN 2794 and 2795 only

...

## 2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS				SINGLE PACKAGINGS
UN number and proper shipping name	Packing conditions	Total quantity per package — passenger	Total quantity per package — cargo	
UN 2794 <b>Batteries, wet, filled with acid</b> UN 2795 <b>Batteries, wet, filled with alkali</b>	<p>Batteries must be placed in an acid/alkali-proof liner of sufficient strength and adequately sealed to positively preclude leakage in the event of spillage. The batteries must be packed so that the fill openings and vents, if any, are upward; they must be incapable of short-circuiting and be securely cushioned in the packagings. The upright position of the package must be indicated on it by "Package orientation" labels (Figure 5-29) as required by 5;3. The words "This side up" or "This end up" may also be displayed on the top of the package.</p> <p><i>Batteries installed in equipment</i></p> <p>If batteries are shipped as an integral component of assembled equipment, they must be securely installed and fastened in an upright position and protected against contact with other articles so as to prevent short circuits. Batteries must be removed and packed according to this packing instruction if the assembled equipment is likely to be carried in other than an upright position.</p>	30 kg	No limit	Unpackaged batteries No

**ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS**

- Packagings must meet the Packing Group II performance requirements.
- For batteries, electric storage, packed with battery fluid in the same outer packaging, see UN 2796 and UN 2797.

**OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)***Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
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)

### Packing Instruction 871

Passenger and cargo aircraft for UN 3028 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

<b>COMBINATION PACKAGINGS</b>				<b>SINGLE PACKAGINGS</b>
<i>UN number and proper shipping name</i>	<i>Packing conditions</i>	<i>Total quantity per package — passenger</i>	<i>Total quantity per package — cargo</i>	
UN 3028 <b>Batteries, dry, containing potassium hydroxide solid</b>	The batteries must be securely cushioned in the packagings.	25 kg	230 kg	Ne

#### **ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS**

- Packagings must meet the Packing Group II performance requirements.

#### **OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)**

##### *Boxes*

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

**Packing Instruction 872**

Passenger and cargo aircraft for UN 2800

**General requirements**

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

- Closures must meet the requirements of 4;1.1.4.

<b>COMBINATION PACKAGINGS</b>				<b>SINGLE PACKAGINGS</b>
<i>UN number and proper shipping name</i>	<i>Packing conditions</i>	<i>Total quantity per package — passenger</i>	<i>Total quantity per package — cargo</i>	
UN 2800 <b>Batteries, wet, non- spillable</b>	Batteries must be protected against short circuits and must be securely packed in strong outer packagings.	No limit	No limit	No

**OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)***Boxes**Drums**Jerricans*

Strong outer packagings

...

— END —