



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Rio de Janeiro, Brazil, 20 to 24 October 2014

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 2017-2018 Edition

2.4: Part 4 — Packing Instructions

DELETION OF CERTAIN PACKING INSTRUCTIONS FOR AEROSOLS

(Presented by D. Brennan)

SUMMARY

This working paper proposes that the existing packing instructions for aerosols, Packing Instructions 203, 204 and 212 be reviewed with the objective of having a single packing instruction, followed by the equivalent limited quantity packing instruction.

Action by the DGP-WG: The DGP-WG is invited to consider the revisions to the packing instructions shown in the appendix to this working paper.

1. INTRODUCTION

1.1 There are currently five packing instructions in the Technical Instructions that apply to UN 1950, **Aerosols** being Packing Instruction 203 and Y203 that are assigned to the majority of the entries for UN 1950, Packing Instruction 204 and Y204 that are assigned to **Aerosols**, non-flammable (containing biological products or a medicinal preparation which will be deteriorated by a heat test) and Packing Instruction 212 that is assigned to **Aerosols**, non-flammable (tear gas devices).

1.2 All of these packing instructions have been in the Technical Instructions since the original 1983 edition. During that time the UN Subcommittee has developed specific test standards for aerosols, the first part of which was adopted into the 14th revised edition of the UN Model Regulations and into the 2007-2008 Edition of the Technical Instructions. Most recently the UN Subcommittee revised the test requirements in the 18th revised edition, the provisions of which have been adopted into the 2015–2016 Edition of the Technical Instructions in Part 6;5.4.

1.3 A review of the three standard packing instructions (Packing Instructions 203, 204 and 212) and of the two limited quantity packing instructions (Packing Instruction Y203 and Y204) identifies

that, as expected there is a large degree of commonality across the packing instructions. The specific differences across the packing instructions are:

- a) Packing Instructions 204 and Y204 limit the size of the aerosols to those with a capacity not exceeding 575 mL. The UN Model Regulations places no such capacity limit on aerosols containing biological products or a medicinal preparation.
- b) Packing Instruction 212 contains additional packing requirements for aerosols, non-flammable which are tear gas devices. This limits the aerosols to those made of metal and requires an additional level of packaging within the outer packagings.
- c) By virtue of decisions taken by the panel in the last biennium, there are also now differences in the permitted outer packagings between those permitted by Packing Instructions 203/Y203 and the other packing instructions.

1.4 In looking at all of these packing instructions and the differences it is believed that Packing Instructions 204, Y204 and 212 are redundant and can be deleted. The UN in 6.2.4.3 of the Model Regulations adopted text that makes specific allowances for pharmaceutical products or products that are used in medical, veterinary or similar applications and provides for alternative test protocols. This text is reflected in Part 6;5.4 of the Technical Instructions.

1.5 For the additional requirements in Packing Instruction 212, it is believed that this can be addressed by the inclusion of the specific quantity limits into a table in Packing Instruction 203 and the requirement for the additional layer of packaging into the “Additional Packing Requirements”.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to revise Packing Instruction 203 as shown in the appendix. If agreed, the consequential amendments would be the deletion of Packing Instructions 204, Y204 and 212 and the revision of Table 3-1 and Packing Instruction Y963 as shown in the appendix to this working paper.

APPENDIX

PROPOSED AMENDMENT TO THE TECHNICAL INSTRUCTIONS

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Part 4

PACKING INSTRUCTIONS

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Chapter 4

CLASS 2 — GASES

Parts of this Chapter are affected by State Variations CA 17, US 6, US 15; see Table A-1

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Packing Instruction 203

Passenger and cargo aircraft for UN 1950 and 2037 only

The general packing requirements of 4;1 must be met.

For the purposes of this packing instruction, a receptacle is considered to be an inner packaging.

Note.— “Receptacle” has the same meaning as set out in 1;3. Any reference in this packing instruction to receptacle will include “aerosols” of UN 1950 and “receptacles, small, containing gas” and “gas cartridges” of UN 2037.

Metal aerosols (IP.7, IP.7A, IP.7B) and non-refillable receptacles containing gas (gas cartridges)

Non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

The following conditions must be met:

- a) the pressure in the receptacle must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;
- b) if the pressure in the receptacle exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;
- c) if the pressure in the receptacle exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;
- d) if the pressure in the receptacle exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;
- e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule for an aerosol. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into the outer metal receptacle;
- f) the liquid content must not completely fill the closed receptacle at 55°C;
- g) each receptacle exceeding 120 mL capacity must have been heated until the pressure in the receptacle is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect.

Plastic aerosols (IP.7C)

Non-refillable plastic aerosols must not exceed 120 mL capacity, except when the propellant is a non-flammable, non-toxic gas and the contents are not dangerous goods in accordance with the provisions of the Technical Instructions, in which case the quantity must not exceed 500 mL.

The following conditions must be met:

- a) the contents must not completely fill the closed receptacle at 55°C;
- b) the pressure in the receptacle may not exceed 970 kPa at 55°C; and
- c) each receptacle must be leak tested in accordance with the provisions of 6;3.2.8.1.6.

<u>UN number and name</u>	<u>Net quantity per package</u>	
	<u>Passenger</u>	<u>Cargo</u>
<u>UN 1950 Aerosols, flammable</u>	<u>75 kg</u>	<u>150 kg</u>
<u>UN 1950 Aerosols, flammable (engine starting fluid)</u>	<u>Forbidden</u>	<u>150 kg</u>
<u>UN 1950 Aerosols, non-flammable</u>	<u>75 kg</u>	<u>150 kg</u>
<u>UN 1950 Aerosols, non-flammable (tear gas devices)</u>	<u>Forbidden</u>	<u>50 kg</u>

ADDITIONAL PACKING REQUIREMENTS

- Packagings must meet Packing Group II performance requirements.
- Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents during normal conditions of air transport.
- Receptacles must be tightly packed, so as to prevent movement.

For UN 1950 — Aerosols, non-flammable (tear gas devices) (cargo aircraft only)

- Only metal receptacles, IP.7, IP.7A, IP.7B are permitted.
- The aerosols must be individually placed into spiral wound tubes fitted with metal ends or a double-faced fibreboard box with suitable padding before being packed into the outer packaging.

OUTER 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)

Packing Instruction 204

The general packing requirements of 4;1 must be met.

~~Aerosols, non-flammable, containing biological products or a medical preparation which will be deteriorated by a heat test, are acceptable in inner non-refillable receptacles not exceeding 575 mL capacity each, providing all the following conditions are met:~~

- ~~— a) the pressure in the aerosol must not exceed 970 kPa at 55°C;~~
- ~~— b) the liquid contents must not completely fill the closed receptacle at 55°C;~~
- ~~— c) one aerosol out of each lot of 500 or less must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect;~~
- ~~— d) the valves must be protected by a cap or other suitable means during transport;~~
- ~~— e) aerosols must be tightly packed, so as to prevent movement, in wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fibreboard boxes (4G) or plastic boxes (4H1, 4H2) of Packing Group II.~~

Packing Instruction Y204

The requirements of 3;4 must be met.

Single packagings are not permitted.

COMBINATION PACKAGINGS:**INNER:**

~~Aerosols, non flammable, containing only a non-toxic substance or substances and biological products or a medical preparation which will be deteriorated by a heat test, are acceptable in inner non-refillable receptacles not exceeding 575 mL capacity each, providing all the following conditions are met:~~

- ~~— a) the pressure in the aerosol must not exceed 970 kPa at 55°C;~~
- ~~— b) the liquid contents must not completely fill the closed receptacle at 55°C;~~
- ~~— c) one aerosol out of each lot of 500 or less must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect;~~
- ~~— d) the valves must be protected by a cap or other suitable means during transport;~~
- ~~— e) aerosols must be tightly packed, so as to prevent movement, in one of the following boxes:~~

OUTER:**Boxes**

- ~~— Fibreboard~~
- ~~— Plastics~~
- ~~— Plywood~~
- ~~— Reconstituted wood~~
- ~~— Wooden~~

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Packing Instruction 212

The general packing requirements of 4;1 must be met.

~~Aerosols, non-flammable, which are tear gas devices are permitted in inner non-refillable metal receptacles not exceeding 1 000 mL capacity each providing all the following conditions are met:~~

- ~~a) the pressure in the aerosol must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;~~
- ~~b) if the pressure in the aerosol does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;~~
- ~~c) if the pressure in the aerosol exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;~~
- ~~d) if the pressure in the aerosol exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;~~
- ~~e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol;~~
- ~~f) the liquid content must not completely fill the closed receptacle at 55°C;~~
- ~~g) each aerosol must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect;~~
- ~~h) the valves must be protected by a cap or other suitable means during transport;~~
- ~~i) aerosols must be individually placed into spiral wound tubes fitted with metal ends or a double-faced fibreboard box with suitable padding, which must be tightly packed in wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fibreboard boxes (4G) or plastic boxes (4H1, 4H2) of Packing Group II. Maximum net quantity per package is 50 kg.~~

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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Packing Instruction Y963

Passenger and cargo aircraft for ID 8000 only

Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for the purposes of personal care or household use. These include items administered or sold to patients by doctors or medical administrations. Except as otherwise provided below, dangerous goods packed in accordance with this packing instruction do not need to comply with 4.1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.

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- ~~i)~~ For aerosols containing a biological or medical preparation which will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 mL capacity each, the following provisions are applicable:
 - ~~1) the pressure in the aerosol must not exceed 970 kPa at 55°C;~~
 - ~~2) the liquid contents must not completely fill the closed receptacle at 55°C;~~
 - ~~3) one aerosol out of each lot of 500 or less must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect; and~~
 - ~~4) the valves must be protected by a cap or other suitable means during transport.~~
- ~~ii)~~ Except for aerosols, inner packagings must not exceed:
 - 1) 500 mL for liquids; and
 - 2) 500 g for solids.
- ~~ki)~~ Consumer commodities shipped according to these provisions may be shipped in a unit load device or other type of pallet prepared by a single shipper provided they contain no other dangerous goods. The shipper must provide the operator with written documentation stating the number of packages of consumer commodities contained in each unit load device or other type of pallet.
- ~~kl)~~ The gross mass on the dangerous goods transport document must be shown as:
 - 1) for one package, the actual gross mass of the package;
 - 2) for more than one package, either the actual gross mass of each package or as the average mass of the packages. (For example, if there are 10 packages and the total gross mass of them is 100 kg, the dangerous goods transport document may show this as "average gross mass per package 10 kg".)
- ~~m)~~ Packages prepared in accordance with these provisions must be durably and legibly marked with the mark shown in Figure 3-1.

Table 3-1. Dangerous Goods List

Name	UN No.	Class or division	Subsidiary risk	State variations	Special provisions	UN packing group	Excepted quantity	Passenger and cargo aircraft		Cargo aircraft	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	6	7	8	9	10	11	12	13
Aerosols, non-flammable	1950	2.2			A98 A145 A167		E0	203- or -204 Y203- or Y204	75 kg 30 kg G	203- or -204	150 kg
Aerosols, non-flammable (tear gas devices)	1950	2.2	6.1	AU 1 CA 7 IR 3 NL 1 US 3	A1 A145 A167		E0	FORBI	DDEN	242 203	50 kg

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