



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTIETH MEETING

Montréal, 24 October to 04 November 2005

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 2007-2008 Edition

PLASTIC AEROSOLS

(Presented by G.A. Leach)

1. INTRODUCTION

1.1 This paper updates the proposal made to working group 05 (DGP-WG05-WP/53) and takes account of a number of comments made since the meeting

1.2 There have been provisions in the UN Model Regulations, RID/ADR and the IMDG Code for the transport of plastic aerosols. This type of receptacle was developed more than 20 years ago but a number of problems meant that it was never taken up on a large commercial scale. Recently there has been renewed commercial interest and a number of prototypes are currently being sold in North America and Japan. Companies wish to export products to Europe and other parts of the world and need a facility to move by air and at present this is only possible under a competent authority approval.

1.3 The aerosol is only being developed for use with non flammable and non toxic gases and the contents will not be a dangerous substance (mainly soaps and foodstuffs).

2. PROPOSAL

(For information, the proposed text is based on a British Standard, BS 5597:1991, some US Exemptions and existing text for IP.7 B)

2.1 It is proposed to add the following text as a new Part 6; 3.2.8

3.2.8 Plastic receptacles (aerosols) non-refillable (IP.7C)

3.2.8.1 Receptacles (aerosols) IP.7C

3.2.8.1.1 *Materials and construction.* The receptacle must be of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyamide (Nylon), or a blend containing some combination of PET, PEN, ethyl vinyl alcohol (EVOR) and Nylon. Thermoplastic processes ensuring uniformity of the completed container shall be applied. No used material other than production residues or regrind from the same manufacturing process may be used. The packaging shall be adequately resistant to ageing and to degradation caused either by the substance contained or by ultra-violet radiation. Maximum capacity must not exceed 500ml.

3.2.8.1.2 Performance tests required:

- drop test
- hydraulic pressure test
- Bursting test
- leakage test

3.2.8.1.3 *Drop test.* Method of testing: To ensure that creep does not affect the ability of the receptacle type to retain the contents the receptacles shall be dropped as follows: Three groups of twenty-five filled receptacles shall be dropped from 1.8m on to a rigid, non-resilient, flat and horizontal surface. One group must be conditioned at 38°C for 26 weeks, the second group for 100 hours at 50°C and the third group for 18 hours at 55°C, prior to the drop test.

Criteria for passing the test successfully: the receptacle must not break or leak.

3.2.8.1.4 *Hydraulic pressure test.* Number of samples: six receptacles. Method of testing: Receptacles must resist a test pressure equal to at least 1200kPa.

Criteria for passing the test successfully: the receptacle must not show major distortions, leaks or similar faults, but a slight symmetrical distortion of the base, or one affecting the profile of the top end shall be allowed, provided that the receptacle passes the bursting test.

3.2.8.1.5 *Bursting test.* Number of samples: six. These may be the same receptacles used in the hydraulic pressure test.

Method of testing and pressures applied: a hydraulic pressure at least 20 per cent higher than the test pressure as mentioned in 3.2.7.3.4 must be applied.

3.2.8.1.6 *Leakage test.* Every aerosol. A leakage test in accordance with Part 6;5.4.2.2 or 5.4.3 approved by the competent authority shall be used.

(This results in the consequential re-numbering of 6;3.2.8 – 10)

2.2 It is proposed to add a new special provision to all entries in Table 3-1 for Aerosols:

AXX Plastic aerosols of a capacity greater than 120mL (IP7C) are only permitted when the propellant are non flammable and non toxic and the contents are not dangerous substances in accordance with the provisions of the Technical Instructions.

2.3 It is proposed to amend 203 and Y203 as follows:

203	PACKING INSTRUCTION 203	203
<p><u>This instruction applies to UN 1950</u></p> <p>The general packing requirements of Part 4, Chapter 1 must be met.</p> <p><u>Single packagings are not permitted.</u></p> <p>Aerosol products are permitted in inner non-refillable non-metal receptacles not exceeding 120 mL capacity each.</p> <p><u>METAL AEROSOLS</u></p> <p>Aerosols and receptacles, containing gas (gas cartridges) are permitted in inner Non-refillable metal <u>aerosols and non-refillable receptacles containing gas (gas cartridges)</u> not exceeding <u>must not exceed</u> 1000 mL capacity each.</p> <p>The following conditions must be met for both metallic and non-metallic receptacles:</p> <ol style="list-style-type: none"> 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) above 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; h) the valves, if fitted, must be protected by a cap or other suitable means during transport; i) receptacles 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. <p><u>PLASTIC AEROSOLS (IP7C)</u></p> <p><u>Non-refillable plastic aerosols must not exceed 500 mL capacity and may only contain non flammable, non toxic gas and contents. The following conditions must be met:</u></p> <ol style="list-style-type: none"> <u>a) the contents shall not completely fill the closed receptacle at 55°C</u> <u>b) the pressure in the container may not exceed 974kPa at 55°C</u> <u>c) each receptacle must be leak tested in accordance with the provisions of Part 6: 3.2.8.1.6.</u> <p><u>ALL AEROSOLS</u></p> <ol style="list-style-type: none"> <u>a) the valves, if fitted, must be protected by a cap or other suitable means during transport;</u> <u>b) receptacles 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.</u> 		

For limited quantities:

Y203	PACKING INSTRUCTION Y203	Y203
<p><u>This instruction applies to UN 1950</u></p> <p>The requirements of Part 3, Chapter 4 must be met.</p> <p>Single packagings are not permitted.</p> <p>COMBINATION PACKAGINGS:</p> <p><i>INNER:</i></p> <p>Aerosol products are permitted in inner non-refillable non-metal receptacles not exceeding 120 mL capacity each. Aerosols and receptacles containing gas (gas cartridges) are not permitted in inner non-refillable metal receptacles not exceeding 1 000 mL capacity each when containing a non-toxic substance. The following conditions must be for both metallic and non-metallic receptacles:</p> <p><u>METAL AEROSOLS</u></p> <p><u>Non-refillable metal aerosols and non-refillable receptacles, containing gas (gas cartridges) must not exceed 1000 mL capacity.</u></p> <ul style="list-style-type: none"> a) the pressure in the receptacle must not exceed 1 245 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, an IP.7A or IP.7B metal receptacle must be used; d) <u>if the pressure in the receptacle exceeds 1245 kPa at 55°C, an IP.7B metal receptacle must be used;</u> e <u>e</u> 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) or c) above 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; e <u>f</u> the liquid content must not completely fill the closed receptacle at 55°C; f <u>g</u> each receptacle exceeding 120 mL capacity 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; g <u>h</u> the valves, if fitted, must be protected by a cap or other suitable means during transport; h <u>i</u> each receptacle must be tightly packed, so as to prevent movement, in one of the following boxes: <p><u>PLASTIC AEROSOLS (IP7C)</u></p> <p><u>Non-refillable plastic aerosols must not exceed:</u></p> <ul style="list-style-type: none"> <u>(i) 500 mL capacity when containing non flammable non toxic gas and contents; or</u> <u>(ii) 120 mL capacity when containing flammable and/or toxic gas and contents.</u> <p><u>The following conditions must be met:</u></p> <ul style="list-style-type: none"> <u>a) the contents must not completely fill the closed receptacle at 55°C</u> <u>b) the pressure in the container may not exceed 974kPa at 55°C</u> <u>c) each receptacle must be leak tested in accordance with the provisions of Part 6:3.2.7.3.</u> 		

ALL AEROSOLS

- a) the valves, if fitted, must be protected by a cap or other suitable means during transport;
- b) receptacles must be tightly packed, so as to prevent movement, in

- OUTER:
 - Boxes
 - Fibreboard
 - Plastic
 - Plywood
 - Reconstituted wood
 - Wooden

— END —