DANGEROUS GOODS PANEL

Frankfurt, 16 to 20 September 2002

Agenda Item 2: Development of recommendations for amendments to the Technical Instructions for incorporation in the 2005/2006 edition

DRAFT AMENDMENTS TO THE TECHNICAL INSTRUCTIONS TO ALIGN TO THE UN RECOMMENDATIONS ---- PART 4

(Presented by the Secretary)

SUMMARY

Below are the draft amendments to Part 4 Chapters 1, 2, 8,11 and reflect the decisions taken by the UN Subcommittee of Experts at the nineteenth, twentieth and twenty first sessions.

Chapter 1

GENERAL PACKING REQUIREMENTS

1.1 GENERAL REQUIREMENTS APPLICABLE TO ALL CLASSES EXCEPT CLASS 7

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1.1.21 For plastic drums and jerricans, unless otherwise approved by the appropriate authority, the period of use permitted for the transport of dangerous substances must be not more than five years from the date of manufacture of the receptacles, except where a shorter period of use is prescribed because of the nature of the substance to be transported.

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CHAPTER 4 CLASS 2 --- GASES

4.1 SPECIAL PACKING PROVISIONS FOR DANGEROUS GOODS OF CLASS 2

4.1.1 General requirements

4.1.1.1 This section provides general requirements applicable to the use of cylinders for the transport of Class 2 gases (e.g. UN 1051 **Hydrogen cyanide, stabilized)**. Cylinders must be constructed and closed so as to prevent any loss of contents which might be caused under normal conditions of transport, including by vibration, or by changes in temperature, humidity or pressure (resulting from change in altitude, for example).

4.1.1.2 Parts of cylinders which are in direct contact with dangerous goods must not be affected or weakened by those dangerous goods and must not cause a dangerous effect (e.g. catalysing a reaction or reacting with the dangerous goods). The provisions of ISO 11114-1:1997 and ISO 11114-2:2000 must be met as applicable. Cylinders for UN 1001 **Acetylene, dissolved** and **UN 3374 Acetylene, solvent free** must be filled with a porous ~~material~~ mass, uniformly distributed, of a type that conforms to the requirements and testing specified by the appropriate national authority and which:

(a) is compatible with the cylinder and does not form harmful or dangerous compounds either with the acetylene or with the solvent in the case of UN 1001; and

(b) is capable of preventing the spread of decomposition of the acetylene in the mass. ~~In the case of UN 1001, the solvent must be compatible with the cylinders.~~

In the case of UN 1001, the solvent must be compatible with the cylinders.

4.1.1.3 Cylinders, including their closures, must be selected to contain a gas or a mixture of gases according to the requirements of 6;5.1.2 and the requirements of the specific packing instructions of this Part.

4.1.1.4 Refillable cylinders must not be filled with a gas or gas mixture different from that previously contained unless the necessary operations for change of gas service have been performed. The change of service for compressed and liquefied gases must be in accordance with ISO 11621:1997, as applicable. In addition, a cylinder that previously contained a Class 8 corrosive substance or a substance of another class with a corrosive subsidiary risk must not be authorized for the transport of a Class 2 substance unless the necessary inspection and testing as specified in 6;5.1.5 have been performed.

4.1.1.5 Prior to filling, the filler must perform an inspection of the cylinder and ensure that the cylinder is authorized for the gas to be transported and that the provisions of these Instructions have been met. Shut-off valves must be closed after filling and remain closed during transport. The ~~consignor~~ shipper must verify that the closures and equipment are not leaking.

Editorial note - renumber subsequent paragraphs

4.1.1.5 Cylinders must be filled according to the working pressures, filling ratios and provisions specified in the appropriate packing instruction for the specific substance being filled. Reactive gases and gas mixtures must be filled to a pressure such that if complete decomposition of the gas occurs, the working pressure of the cylinder must not be exceeded.

4.1.1.6 Cylinders, including their closures, must conform to the design, construction, inspection and testing requirements detailed in Part 6, Chapter 5. When outer packagings are prescribed, the cylinders must be firmly secured therein. Unless otherwise specified in the detailed packing instructions, one or more inner packagings may be enclosed in an outer packaging.

4.1.1.7 Valves must be designed and constructed in such a way that they are inherently able to withstand damage without leakage of product or must be protected from damage which could cause inadvertent release of the contents of the cylinder, by one of the following methods:

(a) Valves are placed inside the neck of the cylinder and protected by a threaded plug or cap;

(b) Valves are protected by caps. Caps must possess vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valves;

(c) Valves are protected by shrouds or guards;

~~(d) Valves are designed and constructed in such a way that they are inherently able to withstand damage without leakage of product;~~

(e) Not used; or

(f) Cylinders are transported in an outer packaging. The packaging as prepared for transport must be capable of meeting the drop test specified in 6;5.5.3 at the packing group I performance level.

For cylinders with valves as described in (b) and (c), the requirements of ISO11117:1998 must be met; for ~~unprotected~~ valves with inherent protection ~~as described in (d)~~, the requirements of annex B of ISO 10297:1999 must be met.

4.1.1.8 Non-refillable cylinders must:

(a) be transported in an outer packaging, such as a box, or crate, or in shrink-wrapped trays or stretch- wrapped trays;

(b) be of a water capacity less than or equal to 1.25 litres when filled with flammable or toxic gas;

(c) not be repaired after being put into service.

4.1.1.9 Refillable cylinders, other than cryogenic receptacles, must be periodically inspected according to the provisions of 6; 5.1.4 and packing instruction~~s~~ PI 200 ~~or P202 as applicable~~. Cylinders must not be charged or filled after they become due for periodic inspection but may be transported after the expiry of the time limit.

4.1.1.10 Repairs must be consistent with the fabrication and testing requirements of the applicable design and construction standards and are only permitted as indicated in the relevant periodic inspection standards specified in 6;5.2.4, ~~consistent with the applicable design and construction standards~~. Cylinders, other than the jacket of closed cryogenic receptacles, must not be subjected to repairs of any of the following;

(a) weld cracks or other weld defects;

(b) cracks in walls;

(c) leaks or defects in the material of the wall, head or bottom.

4.1.1.11 Cylinders must not be offered for filling:

(a) when damaged to such an extent that the integrity of the cylinder or its service equipment may be affected;

(b) unless the cylinder and its service equipment has been examined and found to be in good working order; ~~and~~ or

(c) unless the required certification, retest, and filling markings are legible.

4.1.1.12 ~~Charged~~ Filled cylinders must not be offered for transport;

(a) when leaking;

(b) when damaged to such an extent that the integrity of the cylinder or its service equipment may be affected;

(c) unless the cylinder and its service equipment has been examined and found to be in good working order; ~~and~~ or

(d) unless the required certification, retest, and filling markings are legible.

P203	**PACKING INSTRUCTION**	**P203**

This instruction applies to Class 2 refrigerated liquefied gases in closed cryogenic receptacles. Refrigerated liquefied gases in open cryogenic receptacles must conform to the construction, testing and filling requirements approved by the appropriate national authority.

For closed cryogenic receptacles, the general requirements of 4.1.1 must be met.

Closed cryogenic receptacles constructed as specified in Part 6, Chapter 5 are authorized for the transport of refrigerated liquefied gases.

The closed cryogenic receptacles must be so insulated that they do not become coated with frost.

1. Test pressure

Refrigerated liquids must be filled in closed cryogenic receptacles with the following minimum test pressures:

(a) For closed cryogenic receptacles with vacuum insulation, the test pressure must not be less than 1.3 times the sum of the maximum internal pressure of the filled receptacle, including during filling and discharge, plus 100 kPa (1 bar);

(b) For other closed cryogenic receptacles, the test pressure must be not less than 1.3 times the maximum internal pressure of the filled receptacle, including during filling and discharge.

2. Degree of filling

For non-flammable, non-toxic refrigerated liquefied gases the liquid phase at the filling temperature and at a pressure of 100 kPa (1 bar) must not exceed 98% of the water capacity.

For flammable refrigerated liquefied gases the degree of filling must remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the relief valve, the volume of the liquid phase would reach 98% of the water capacity at that temperature.

3. Pressure-relief devices

Closed cryogenic receptacles must be fitted with at least one pressure-relief device.

4. Compatibility

Materials used to ensure the leakproofness of the joints or for the maintenance of the closures must be compatible with the contents. In the case of receptacles intended for the transport of oxidizing gases, (i.e. with a subsidiary risk of 5.1) these materials must not react with these gases in a dangerous manner.

P620	PACKING INSTRUCTION	P620

This instruction applies to UN Nos. 2814 and 2900.

The following packagings are authorized provided the special packing provisions of **4.1.8** are met:

Packagings meeting the requirements of Chapter 6.3 and approved accordingly consisting of:

(a) Inner packagings comprising*:*

(i) watertight primary receptacle(s);

(ii) a watertight secondary packaging;

(iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them;

(b) A rigid outer packaging of adequate strength for its capacity, mass and intended use. The smallest external dimension shall be not less than 100 mm.

Additional requirements:

1. Inner packagings containing infectious substances shall not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of 1.2.1 and 5.1.2: such an overpack may contain dry ice.

2. Other than for exceptional consignments, e.g. whole organs which require special packaging, the following additional requirements shall apply:

(a) Substances consigned at ambient temperatures or at a higher temperature. Primary receptacles shall be of glass, metal or plastics. Positive means of ensuring a leakproof seal shall be provided, e.g. a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they shall be secured by positive means, e.g., tape, paraffin sealing tape or manufactured locking closure*;*

(b) Substances consigned refrigerated or frozen. Ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.1.1. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;

(c) Substances consigned in liquid nitrogen. Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen.

(d) Lyophilized substances may also be transported in primary receptacles that are flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals;

3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range -40 ºC to +55 ºC.

P 650 PACKING INSTRUCTION P650

This packing instruction applies to UN 3373

Part 1: Provisions for primary receptacles that do not exceed 500 mL or 500 g

1. The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during transport, including transhipment between transport units and between transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings shall be constructed and closed to prevent any loss of contents that might be caused under normal conditions of transport by vibration or by changes in temperature, humidity or pressure.

2. The packaging shall consist of three components:

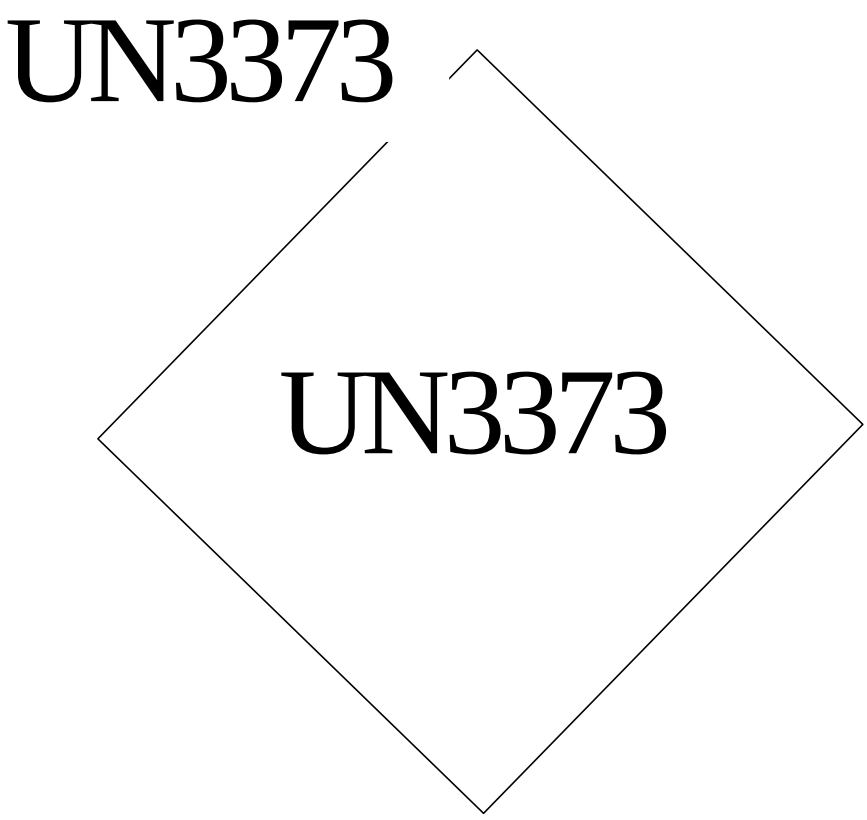
(a) a primary receptacle,

(b) a secondary packaging, and

(c) an outer packaging.

3. Primary receptacles shall be packed in secondary packagings in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or of the outer packaging.

4. For transport, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall be clearly visible and legible. The width of the line shall be at least 2 mm; the letters and numbers shall be at least 6 mm high.



The completed package shall be capable of successfully passing the drop test in 6.3.2.5 as specified in 6.3.2.3 and 6.3.2.4 except that the height of the drop shall not be less than 1.2 m.

Liquid substances

1. The primary receptacle(s) shall be leakproof and shall not contain more than 500 mL of the liquid substance.

2. The secondary packaging shall be leakproof.

3. If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them.

4. Absorbent material shall be placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging.

5. The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar).

6. The outer packaging shall not contain more than 4 litres of the liquid substance.

P 650 PACKING INSTRUCTION (cont'd) P650

Solid substances

1. The primary receptacle(s) shall be sift proof and shall not contain more than 500 g of the solid substance.

2. The secondary packaging shall be siftproof.

3. If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them.

4. The outer packaging shall not contain more than 4 kg of the solid substance.

Dry ice and liquid nitrogen

(a) When UN 1845, Carbon Dioxide, Solid, (dry ice) is used as a refrigerant, the packaging shall be designed and constructed to permit the release of the gaseous carbon dioxide to prevent the build up of pressure that could rupture the packaging.

(b) Substances consigned in liquid nitrogen or dry ice shall be packed in primary receptacles that are capable of withstanding very low temperatures. The secondary packaging shall also be capable of withstanding very low temperatures and, in most cases, will need to be fitted over the primary receptacle individually.

Infectious substances in Category B which are packed and marked in accordance with Part 1 of this packing instruction are not subject to any other requirement in these Regulations.

Part 2: Provisions for primary receptacles that exceed 500 mL or 500 g (liquid and solid) or outer packagings that exceed 4 L or 4 kg.

1. When the primary receptacle(s) contain substances in excess of 500 mL or 500 g, the following packagings shall be used and shall meet the general provisions of 4.1.1 and 4.1.3 and the requirements of Chapter 6.1 at the packing group II performance level.

2. The packaging shall consist of three components:

(a) a primary receptacle,

(b) a secondary packaging, and

(c) a rigid outer packaging.

3. For liquids

(a) the primary receptacle and the secondary packaging shall be watertight,

(b) an absorbent material shall be placed between the primary receptacle(s) and the secondary packaging in a quantity sufficient to absorb the entire liquid content of the primary receptacle(s),

(c) if multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them

(d) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar).

4. For solids, the primary receptacle and the secondary packaging shall be siftproof.

5. Outer packagings constructed of suitable material of adequate strength and design in relation to the packaging capacity and its intended use shall be used. The smallest external dimension shall be not less than 100 mm.

Infectious substances in Category B which are packed in accordance with Part 2 of this packing instruction are subject to all the other requirements in these Regulations. The UN number and proper shipping name are UN 3373, DIAGNOSTIC SPECIMENS or CLINICAL SPECIMENS. The label for Division 6.2 is required.

P904 **PACKING INSTRUCTION** **P904**

This packing instruction applies to UN3245. The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Packagings according to P001 or P002 conforming to the packing group III performance level.

(2) Outer packagings, which need not conform to the packaging test requirements of Part 6, but conforming to the following:

(a) an inner packaging comprising

(i) a watertight primary receptacle(s);

(ii) a watertight secondary packaging which is leakproof;

(iii) absorbent material placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in a quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

(iv) if multiple fragile primary receptacles are placed in a single secondary packaging they shall be individually wrapped or separated to prevent contact between them.

(b) an outer packaging shall be strong enough for its capacity, mass and intended use and the smallest external dimension shall be at least 100 mm.

Additional requirement

Dry Ice and Liquid Nitrogen

When UN1845, Carbon Dioxide, Solid, (dry ice) is used as a refrigerant, the packaging shall be designed and constructed to permit the release of the gaseous carbon dioxide to prevent the build up of pressure that could rupture the packaging.

Substances consigned in liquid nitrogen or dry ice shall be packed in primary receptacles that are capable of withstanding very low temperatures. The secondary packaging shall also be capable of withstanding very low temperatures and, in most cases, will need to be fitted over the primary receptacle individually.

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