

**DANGEROUS GOODS PANEL (DGP)**

**NINETEENTH MEETING**

**Montreal, 27 October to 7 November 2003**

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

**AMENDMENTS TO THE TECHNICAL INSTRUCTIONS TO ALIGN  
WITH THE UN RECOMMENDATIONS — PART 4**

(Presented by the Secretary)

**SUMMARY**

Below are the amendments to Part 4 Chapters 1, 2, and 11 and reflect the decisions taken by the UN Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals at the first session (Geneva, 11 to 13 December 2002) and as modified by the meetings of the Working Group of the Whole (Frankfurt, 16 to 20 September 2002 and Montreal, 5 to 9 May 2003). Reformatted packing instructions are presented in separate working papers.

**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 national authority, the period of use permitted for the transport of dangerous substances goods 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.

**Secretarial Note:** See *WG/03-WP/57, paragraph 6.1.5*

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**Chapter 2****GENERAL**

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2.4 Where the packing instructions in this part authorize the use of a particular type of ~~outer~~ packaging ~~in a combination packaging~~ (e.g. 4G, 1A2), packagings bearing the same packaging identification code followed by the letter "V" marked in accordance with the requirements of 6;4.1.7 h) (e.g. 4GV; 1A2V) may also be used under the same conditions and limitations applicable to the use of that type of ~~outer~~ packaging according to the relevant packing instruction. For example, a combination packaging marked with the packaging code "4GV" may be used whenever a combination packaging marked "4G" is authorized, provided the requirements in the relevant packing instruction regarding types of inner packagings and quantity limitations are respected.

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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~~ UN 1072 **Oxygen, compressed**). 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 **porous 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.

4.1.1.56 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.

4.1.1.67 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.

4.1.1.78 Valves must be **designed and constructed in such a way that they are inherently able to withstand damage without release of the contents 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)d Not used; or
- (f)e 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.

4.1.1.89 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 ~~10~~ Refillable cylinders, ~~other than cryogenic receptacles~~, must be periodically inspected according to the provisions of ~~6; 5.1.5 and~~ packing instructions 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 ~~11~~ 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 ~~12~~ 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 ~~13~~ ~~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.

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## PACKING INSTRUCTION 200

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Gas specific provisions:

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k) Aluminium alloy cylinders must be:

- Equipped only with brass or stainless steel valves; and
- Cleaned in accordance with ISO 11621:1997 and not contaminated with oil.

- l) (i) The wall thickness of cylinders must be not less than 3mm.  
 (ii) Prior to transport it must be ensured that the pressure has not risen due to potential hydrogen generation.

Periodic inspection:

h)m The interval between periodic tests may be extended to 10 years for aluminium alloy cylinders when the alloy of the cylinder has been subjected to stress corrosion testing as specified in ISO 7866:1999.

m)n The interval between periodic inspections for steel cylinders may be extended to 15 years if approved by the appropriate national authority of the country of use.

Requirements for N.O.S. descriptions and for mixtures:

h)o The construction materials of the cylinders and their accessories must be compatible with the contents and must not react to form harmful or dangerous compounds therewith.

The test pressure and filling ratio must be calculated in accordance with the relevant requirements of (PI 200).

The necessary steps must be taken to prevent dangerous reactions (i.e. polymerization or decomposition) during transport. If necessary, stabilization or addition of an inhibitor must be required.

*Note.— For the carriage of oxygen to provide life support to aquatic animals, see Note 7 of the Introductory Notes to this Part.*

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**Table 2. LIQUEFIED GASES AND DISSOLVED GASES**

UN No.	Name and description	Class or Division	Subsidiary risk	LC <sub>50</sub> ml/m <sup>3</sup>	Cylinders	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1010	<b>Butadienes and hydrocarbon mixture, stabilized</b> (mixtures of 1,3-butadiene and hydrocarbons) containing more than 40% butadienes	2.1			X	10	40	0.50	v z

<b>P2XX</b>	<b>PACKING INSTRUCTION</b>	<b>P2XX</b>
<p>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.</p> <p>For closed cryogenic receptacles, the general requirements of Part 4, Chapter 1 must be met.</p> <p>Closed cryogenic receptacles constructed as specified in Part 6, Chapter 5 are authorized for the transport of refrigerated liquefied gases.</p> <p>The closed cryogenic receptacles must be so insulated that they do not become coated with frost.</p> <p>1. <u>Test pressure</u></p> <p>Refrigerated liquids must be filled in closed cryogenic receptacles with the following minimum test pressures:</p> <p>(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);</p> <p>(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 taking into account the pressure developed during filling and discharge.</p> <p>2. <u>Degree of filling</u></p> <p>For non-flammable, non-toxic refrigerated liquefied gases the volume of liquid phase at the filling temperature and at a pressure of 100 kPa (1 bar) must not exceed 98 per cent of the water capacity.</p> <p>For flammable refrigerated liquefied gases the degree of filling must remain below the level at which, the volume of the liquid phase would reach 98 per cent of the water capacity at that temperature, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the relief valve.</p> <p>3. <u>Pressure-relief devices</u></p> <p>Closed cryogenic receptacles must be fitted with at least one pressure-relief device.</p> <p>4. <u>Compatibility</u></p> <p>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.</p>		

