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**COMMITTEE OF EXPERTS ON THE TRANSPORT OF  
DANGEROUS GOODS AND ON THE GLOBALLY  
HARMONIZED SYSTEM OF CLASSIFICATION  
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the  
Transport of Dangerous Goods

Twenty-fifth session, 5-14 July 2004  
Item 4 (c) of the provisional agenda

PACKAGINGS

Miscellaneous proposals

Revision of 4.1.3 to incorporate requirements for pressure receptacles  
to containing liquid or solid dangerous goods other than of Class 2

Transmitted by the expert from the United Kingdom

**Introduction**

1. The Sub-Committee will recall the two papers on this topic, (ST/SY/AC.10/C.3/2003/9 from the expert from the United Kingdom, UN/SCETDG/24/INF 48 from the expert from the United States of America) that were presented at the 24th session in December 2003. In his previous paper, 2003/9, the expert from the United Kingdom noted that during the revision of the packing instructions it was recognised that some substances other than those of Class 2 in the Dangerous Goods List may be transported, or are required to be transported, in cylinders.
2. In the 11th edition of the Model Regulations, it was agreed that where the use of cylinders was required the user was referred to P200, which stated that they must be approved by the Competent Authority. However with the publication of the 12th edition of the Model Regulations and the revision of P200 and Chapter 6.2, the expert from the United Kingdom suggested that the references in other Packing Instructions to P200 are no longer appropriate.
3. On further consideration the expert from the United Kingdom believes that not only cylinders but also other pressure receptacles can be used for the transport of substances other than in Class 2. He believes that such pressure receptacles must meet the construction requirements of Chapter 6.2 and that changes should be made to the packing instructions to reflect this.

4. While there was general support from the Sub-Committee during the December session when the expert from the United Kingdom presented his original paper, it was felt that more work was needed on the proposal. It was agreed that a revised paper should be produced taking in the comments from other experts.
5. After consideration of comments received, the expert of the United Kingdom believes that a generic approach is needed rather than amendment of particular Packing Instructions relevant to specific substances. This would permit the Regulations to keep pace with rapidly developing initiatives in industry. This revised proposal therefore addresses pressure receptacles whether pressurised in transport or not and is applicable to any permitted substance and any packing instruction which permits the use of pressure receptacles.
6. In order to achieve this objective it is felt appropriate to include such provisions in Chapter 4.1 of the Model Regulations. In order to avoid significant re-numbering and tedious cross-referencing, the new provisions have been incorporated in a revised new paragraph 4.1.3.4 to replace old 4.1.3.6. In so doing, the opportunity has been taken to introduce sub-headings to various sub-sections of section 4.1.3 (as was the case with existing 4.1.3.8) to give greater clarity for the user. No change has been made to the existing texts of 4.1.3.2 to 4.1.3.5 and 4.1.3.7 to 4.1.3.8.
7. Hence the revised proposal for a new sub-section 4.1.3.4 is shown (in italics) in the context of the whole text of section 4.1.3. Thereafter consequential amendments to individual Packing Instructions are proposed and cross-referencing in Chapters 4.1 and 6.2.
8. The revised proposal to amend section 4.1.3 is set out below. The expert from the United Kingdom hopes that he has taken in the comments from other experts including those from the expert of the United States of America in his INF 48 from the previous session.

## **Proposal**

### **4.1.3        *General provisions concerning packing instructions***

#### **4.1.3.1      General**

4.1.3.1.1     Packing instructions applicable to dangerous goods of Classes 1 to 9 are specified in 4.1.4. They are subdivided depending on the type of packagings to which they apply:

- 4.1.4.1        for packagings other than IBCs and large packagings; these packing instructions are designated by an alphanumeric code comprising the letter "P";
- 4.1.4.2        for IBCs; these are designated by an alphanumeric code comprising the letters "IBC";
- 4.1.4.3        for large packagings; these are designated by an alphanumeric code comprising the letters "LP".

Generally, packing instructions specify that the general provisions of 4.1.1, 4.1.2 and/or 4.1.3, as appropriate, are applicable. They may also require compliance with the special provisions of sections 4.1.5, 4.1.6, 4.1.7, 4.1.8 or 4.1.9 when appropriate. Special packing provisions may also be specified in the packing instruction for individual substances or articles. They are also designated by an alphanumeric code comprising the letters:

"PP" for packagings other than IBCs and large packagings  
"B" for IBCs  
"L" for large packagings.

Unless otherwise specified, each packaging shall conform to the applicable requirements of Part 6. Generally packing instructions do not provide guidance on compatibility and the user should not select a packaging without checking that the substance is compatible with the packaging material selected (e.g. most fluorides are unsuitable for glass receptacles). Where glass receptacles are permitted in the packing instructions porcelain, earthenware and stoneware packagings are also allowed.

4.1.3.1.2 Column 8 of the dangerous goods list shows for each article or substance the packing instruction(s) that shall be used. Column 9 indicates the special packing provisions applicable to specific substances or articles.

4.1.3.1.3 Each packing instruction shows, where applicable, the acceptable single and combination packagings. For combination packagings, the acceptable outer packagings, inner packagings and when applicable the maximum quantity permitted in each inner or outer packaging, are shown. Maximum net mass and maximum capacity are as defined in 1.2.1.

#### **4.1.3.2 Solids liable to become liquid during transport**

4.1.3.2.1 The following packagings shall not be used when the substances being transported are liable to become liquid during transport:

##### Packagings

Drums:	1D and 1G
Boxes:	4C1, 4C2, 4D, 4F, 4G and 4H1
Bags:	5L1, 5L2, 5L3, 5H1, 5H2, 5H3, 5H4, 5M1 and 5M2
Composite packagings:	6HC, 6HD2, 6HG1, 6HG2, 6HD1, 6PC, 6PD1, 6PD2, 6PG1, 6PG2 and 6PH1

##### Large packagings

Flexible plastics:	51H (outer packaging)
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##### IBCs

For substances of packing group I: All types of IBCs;

For substances of packing groups II and III:

Wooden:	11C, 11D and 11F
Fibreboard:	11G
Flexible:	13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2
Composite:	11HZ2 and 21HZ2.

#### **4.1.3.3      Equivalent packaging**

4.1.3.3.1    Where the packing instructions in this chapter authorize the use of a particular type of packaging (e.g. 4G; 1A2), packagings bearing the same packaging identification code followed by the letters "V", "U" or "W" marked in accordance with the requirements of Part 6 (e.g. 4GV, 4GU or 4GW; 1A2V, 1A2U or 1A2W) may also be used under the same conditions and limitations applicable to the use of that type of packaging according to the relevant packing instructions. 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.

#### **4.1.3.4      Pressure receptacles for liquids and solids**

4.1.3.4.1    *Unless otherwise indicated in these Regulations, pressure receptacles conforming to the applicable requirements of Chapter 6.2 are authorized for the transport of any liquid or solid substance other than explosives, thermally unstable substances, organic peroxides, self reactive substances, substances where significant pressure may develop by evolution of chemical reaction and radioactive material unless permitted in 4.1.9.*

4.1.3.4.2    *Pressure receptacles having a minimum test pressure of 6 bar shall be used.*

4.1.3.4.3    *Valves shall be protected with valve protection caps or collars or the pressure receptacles, shall be packaged in strong rigid outer packagings. Where an outer packaging is used pressure receptacles shall be secured to prevent movement in the outer packaging.*

4.1.3.4.4    *The level of filling shall not exceed 90% of the capacity of the pressure receptacle.*

4.1.3.4.5    *Pressure receptacles shall be subjected to a periodic inspection and test every 5 years. Pressure receptacles shall not be filled after they become due for periodic inspection and test but may be transported after the expiry of the time limit. Pressure receptacle repairs shall meet the requirements of 4.1.6.1.11.*

4.1.3.4.6    *Prior to filling, the filler shall perform an inspection of the pressure receptacle and ensure that the pressure receptacle is authorized for the substances to be transported and that the provisions of these Regulations have been met.*

4.1.3.4.7    *Refillable pressure receptacles shall not be filled with a substance different from that previously contained unless the necessary operations for change of service have been performed.*

#### **4.1.3.5      Competent authority approvals**

4.1.3.5.1    Packagings or IBCs not specifically authorized in the applicable packing instruction shall not be used for the transport of a substance or article unless specifically approved by the competent authority and provided:

- (a)   The alternative packaging complies with the general requirements of this Part;
- (b)   When the packing instruction indicated in the Dangerous Goods List so specifies, the alternative packaging meets the requirements of Part 6;

- (c) The competent authority determines that the alternative packaging provides at least the same level of safety as if the substance were packed in accordance with a method specified in the particular packing instruction indicated in the Dangerous Goods List; and
- (d) A copy of the competent authority approval accompanies each consignment or the transport document includes an indication that alternative packaging was approved by the competent authority.

**NOTE:** *The competent authorities granting such approvals should take action to amend these Model Regulations to include the provisions covered by the approval as appropriate.*

#### **4.1.3.6 Unpackaged articles other than Class 1 articles**

**4.1.3.6.1** Where large and robust articles cannot be packaged in accordance with the requirements of Chapters 6.1 or 6.6 and they have to be transported empty, uncleared and unpackaged, the competent authority may approve such transport. In doing so the competent authority shall take into account that:

- (a) Large and robust articles shall be strong enough to withstand the shocks and loadings normally encountered during transport including trans-shipment between transport units and between transport units and warehouses, as well as any removal from a pallet for subsequent manual or mechanical handling;
- (b) All closures and openings shall be sealed so that there can be no loss of contents which might be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). No dangerous residue shall adhere to the outside of the large and robust articles;
- (c) Parts of large and robust articles, which are in direct contact with dangerous goods:
  - (i) shall not be affected or significantly weakened by those dangerous goods; and
  - (ii) shall not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods;
- (d) Large and robust articles containing liquids shall be stowed and secured to ensure that neither leakage nor permanent distortion of the article occurs during transport;
- (e) They shall be fixed in cradles or crates or other handling devices in such a way that they will not become loose during normal conditions of transport.

**4.1.3.8.2** Unpackaged articles approved by the competent authority in accordance with the provisions of 4.1.3.8.1 shall be subject to the consignment procedures of Part 5. In addition the consignor of such articles shall ensure that a copy of any such approval is transported with the large and robust articles.

**NOTE:** *A large and robust article may include flexible fuel containment systems, military equipment, machinery or equipment containing dangerous goods above the limited quantity thresholds.*

### **Consequential amendments**

#### **Packing Instructions**

P400 Delete (1) and replace it with the following:

“(1) Pressure receptacles shall have a minimum design pressure of 150bar.”

P401 and P402 delete (1) entirely and renumber remaining parts.

P601 and P602 Delete (4) and replace it with the following:

“(4) Pressure receptacles shall have a minimum test pressure of 10bar and shall not be equipped with any pressure relief devices”

P800 delete (1) and renumber remaining parts.

P802 delete (5)

#### **Chapter 4.1**

At the end of paragraph 4.1.1.13 insert "see paragraph 4.1.3.2".

(This is to demonstrate that there is a link between the general provisions of 4.1.1 and the general provisions concerning packing instructions.)

#### **Chapter 6.2**

Amend 6.2.1.1.5 to read as follows:

“6.2.1.1.5 The test pressure of cylinders, tubes, pressure drums and bundles of cylinders shall be in accordance with packing instruction P200, P400, P601, P602 or 4.1.3.4 as appropriate. The test pressure for closed cryogenic receptacles shall be in accordance with packing instruction P203.”

In 6.2.2.7.2(j) add "liquids and solids" so that the first two lines read as follows:

"(j) In the case of pressure receptacles for liquefied gases, refrigerated liquefied gases, liquids and solids the water capacity in litres expressed to three significant digits rounded down to the last digit,...".

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