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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-fourth session, 1-10 December 2003,  
agenda item 9)

**MISCELLANEOUS PROPOSALS OF AMENDMENTS TO THE MODEL REGULATIONS  
ON THE TRANSPORT OF DANGEROUS GOODS**

**Transport of dangerous goods marking requirements**

**Orientation Arrows**

**Transmitted by the expert from the United States of America**

**Background**

1. The requirement for orientation markings applies for combination packagings containing liquids in various regulations including the ICAO Technical Instructions, ADR/RID and 49 CFR. The markings indicate the appropriate package orientation to minimize the potential for leakage of inner packagings. At the first session of the Committee in December 2002 (see ST/SG/AC.10/29/Add.1) it was agreed to add a new paragraph 5.2.2.1.13 to require orientation arrows on gas receptacles containing refrigerated liquefied gases. The expert from the United States is of the opinion that orientation arrows should also be required in the Model Regulations for combination packagings containing liquids. It is also noted that the orientation arrows are markings not labels, as the background color is not specified, the border is optional, and the color of the arrows may be red or black. The arrows do not communicate hazards they are intended to provide information relative to safe handling. Currently many packagings (e.g. fibreboard boxes) are pre-printed with the arrows in the correct orientation rather than being affixed as a label after the package is produced. Therefore, it is proposed that the orientation marking requirement be included in Chapter 5.2 of the Model Regulations.

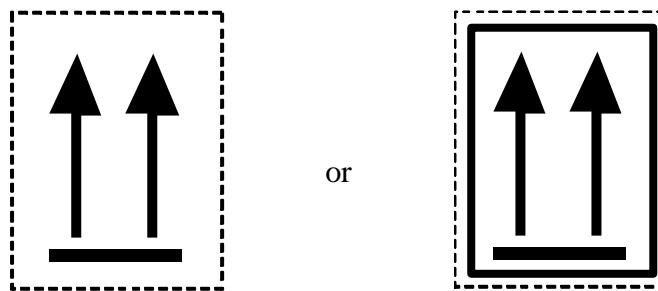
2. In addition to proposing to include orientation markings in the Model Regulations, this paper is also proposing to require shippers to pack inner packaging in the orientation prescribed by the orientation arrows and to require carriers to load and transport packages loaded on a transport vehicle or within a freight container in accordance with such markings.

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**Proposal**

2. Delete the current 5.2.2.1.13
3. Add the following new paragraphs in 5.2.1.6:

5.2.1.6 Except as provided in 5.2.1.6.1, combination packagings having inner packagings containing liquid dangerous goods, overpacks containing liquid dangerous goods and open cryogenic receptacles intended for the transport of refrigerated liquefied gases must be legibly marked with package orientation arrows that are similar to the illustration shown below or with those meeting the specifications of ISO Standard 780:1985. The orientation arrows shall appear on two opposite vertical sides of the package with the arrows pointing in the correct upright direction. They shall be rectangular and of a size that is clearly visible commensurate with the size of the packaging. Depicting a rectangular border around the arrows is optional.



Two black or red arrows on white  
or suitable contrasting background  
The rectangular border is optional

5.2.1.6.1 Orientation arrows are not required on packages containing:

- (a) inner packagings which are gas receptacles;
- (b) flammable liquids in inner packagings of not more than 120 mL that are prepared with sufficient absorbent material between the inner and outer packagings to completely absorb the liquid contents;
- (c) Division 6.2 infectious substances in primary receptacles of not more than 50 ml;

*Note: The Sub-Committee should consider a total exception for infectious substances packagings on the basis that packaging designs have evolved whereby the orientation of the upright orientation of the primary receptacle is not necessary due to the means of closure and the quantity, configuration and placement of the absorbent material.*

- (d) Class 1 explosives or Class 7 radioactive materials; or
- (e) liquids contained in manufactured articles (e.g., alcohol or mercury in thermometers) which are leak-tight in all orientations.

5.2.1.6.2 Arrows for purposes other than indicating proper package orientation shall not be displayed on a package marked in accordance with this paragraph.

4. It is also proposed to amend 4.1.1.5 to require shippers to orient inner packagings containing liquids in an upright position consistent with the direction of the orientation arrows marked on the outer packaging. The following is proposed:

Amend 4.1.1.5 by adding the twonew sentences as follows:

4.1.1.5 Inner packagings shall be packed in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the outer packaging. ***Inner packagings containing liquids shall be packaged with their closures upward and placed within outer packagings consistent with the orientation markings prescribed in 5.2.1.6 of these Regulations.*** Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material or of the outer packaging. ***Each package bearing package orientation markings as prescribed in 5.2.1.6 of these Regulations that is overpacked or placed in a large packaging shall be oriented in accordance with such markings.***

5. It is proposed to amend Part 7 to indicate that carriers must transport packages consistent with the orientation markings. The following is proposed:

Amend 7.1.1.4 by adding the following additional sentences:

“Each package containing dangerous goods bearing package orientation markings as prescribed in 5.2.1.6 of these Regulations shall be loaded on a transport vehicle, aircraft, vessel, in an overpack or within a transport unit in accordance with such markings. Packages shall remain in the correct position indicated by the markings during normal conditions of transport.”

#### **Action requested of the Sub-Committee**

3. The Sub-Committee is invited to consider this proposal and take action as deemed appropriate.

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