



Secretariat

Distr.  
GENERAL

ST/SG/AC.10/C.3/2008/45  
14 April 2008

Original: ENGLISH

---

**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

Thirty-third session  
Geneva, 30 June-9 July (a.m) 2008  
Item 3 of the provisional agenda

**PERFORMANCE OF PACKAGINGS, INCLUDING IBCs**

Permeation through the walls of plastics packagings, including IBCs, with the hazard of build-up of explosive atmospheres in freight containers

Transmitted by the expert from Germany\*

**Introduction**

1. The German expert presented at the 32<sup>nd</sup> session of the Sub-Committee in December 2007, informal document UN/SCETDG/32/INF.30 on permeation through the walls of plastics packagings and the herewith associated hazard of build-up of explosive atmospheres in freight containers.

The results of the research project and the outcome of the discussion in the Sub-Committee were the base for the proposal with following elements:

---

\* In accordance with the programme of work of the Sub-Committee for 2007-2008 approved by the Committee at its third session (refer to ST/SG/AC.10/C.3/60 para. 100 and ST/SG/AC.10/C.3/34, para. 14).

- (a) Adding an analogous permeation requirement in chapters 4.1 and 6.1 (plastics drums, plastics jerricans, specific composite packagings (plastics material) and combination packagings with plastics inner packagings) as set out in 6.5.5.3.2, 6.5.5.4.6 and 6.6.4.3.1.
- (b) Adding provisions in Chapter 5.5 concerning documentation and identification of transport units with potential hazard of explosion caused by permeation in order to apply measures of ventilation to remove any potentially explosive atmosphere prior to unloading the transport unit (proposed warning sign according to the Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work).
- (c) Adding provisions that the requirement to avoid any danger by permeation can be covered if technical means, e.g. EVOH permeation barriers, fluorinated surfaces or modified materials (see UN/SCETDG/32/INF.30) are applied to all concerned packagings and IBCs to reduce the rate of permeation or to be transported in well ventilated containers or under cool conditions.

## Proposal

2. Amend 4.1.1.1 of the Model Regulations to read as follows (amendments are underlined.):

4.1.1.1 Dangerous goods shall be packed in good quality packagings, including IBCs and large packagings, which 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 or overpack for subsequent manual or mechanical handling. Packagings, including IBCs and large packagings, shall be constructed and closed so as to prevent any loss of contents when prepared for transport which may be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). Packagings, including IBCs and large packagings, shall be closed in accordance with the information provided by the manufacturer. No dangerous residue shall adhere to the outside of packages, IBCs and large packagings during transport. Any permeation of the substance contained shall not constitute a danger under normal conditions of transport. These provisions apply, as appropriate, to new, reused, reconditioned or remanufactured packagings, and to new, reused, repaired or remanufactured IBCs, and to new or reused large packagings.

*Note 1: In case of transport of substances with potential hazard of build-up of explosive atmospheres caused by permeation, the provision of 5.5.3 have to be applied to the transport unit.*

*Note 2: The requirement to avoid any danger by permeation can be covered if technical means are applied to packagings and IBCs to reduce the rate of permeation or if they are transported in well ventilated transport units or under cool conditions.*

3. Amend 6.1.4.8.1 of the Model Regulations to read as follows (amendments are underlined.):

6.1.4.8.1 The packaging shall be manufactured from suitable plastics material and be of adequate strength in relation to its capacity and intended use. Except for recycled plastics material as defined in 1.2.1, 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 ultraviolet radiation. Any permeation of the substance contained shall not constitute a danger under normal conditions of transport.

4. Amend Chapter 5.5 of the Model Regulations to read as follows (amendments are underlined.):

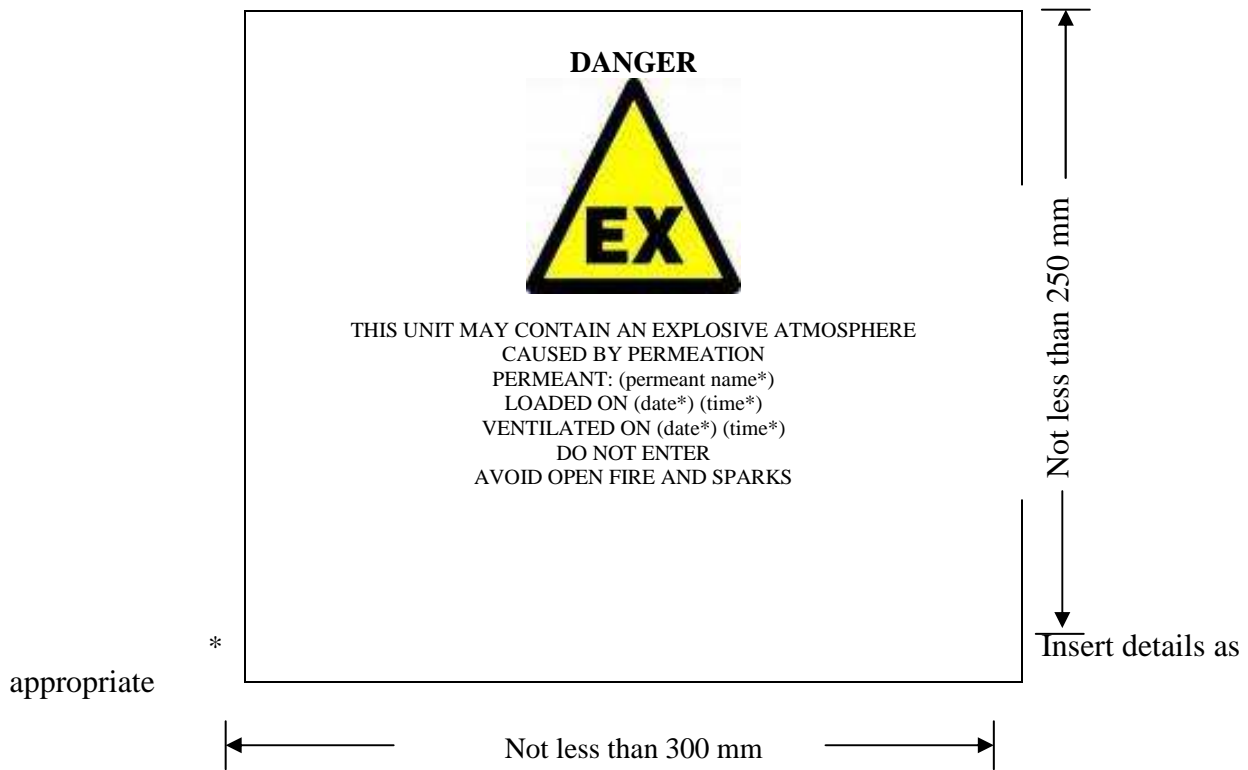
### **5.5.3 Documentation and identification of units with potential hazard of explosion caused by permeation**

5.5.3.1 In case of transport of substances with potential hazard of explosion caused by permeation in plastics packagings according to 6.1.4.8.1, plastics IBCs according to 6.5.5.3.2, composite IBCs with plastics inner receptacles according to 6.5.5.4.6 and plastics large packagings according to 6.6.4.3.1 transport documents associated with these transports shall show the date of loading and the type of the respective dangerous good (permeant) (see also 5.4.1.4).

5.5.3.2 A warning sign as specified in 5.5.3.3 shall be placed on each unit with potential hazard of explosion in a location where it will be easily seen by persons attempting to enter the interior of the unit. The marking, as required by this paragraph, shall remain on the unit until the following provisions are met:

- (a) The unit has been ventilated to reduce the concentration of the permeant gas to go below the lower explosive limit of the permeant;
- (b) In the immediate vicinity of the unit there is no open fire or sparks; and
- (c) The permeating compounds have been unloaded.

5.5.3.3 The explosion hazard warning sign shall be rectangular and shall not be less than 300 mm wide and 250 mm high. The markings shall be black print on a white background with lettering not less than 8 mm high. An illustration of this sign is given in Figure 5.5.2.



**Figure 5.5.2: Explosion hazard warning sign**

---