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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 4 (b))

**PACKAGINGS (INCLUDING IBC'S AND LARGE PACKAGINGS)**

**Performance testing (Vibration and puncture test)**

**Miscellaneous proposals about the puncture test**

**Transmitted by the expert from Spain**

1. Among the various types of punctures of packagings during transport there are the following:
  - a) Puncture due to corrosion in some parts of the packaging;
  - b) Puncture by buckling during transport due to the stacking of the packaging;
  - c) Puncture by impact during handling while storing or loading packagings in palettes, particularly in port areas;
  - d) Puncture by nails (placed on the floor or in palettes) due to movement during transport.
  
2. Experimental tests have shown that metallic and plastic packagings (except the IBC's which have not been tested) cannot pass some puncture tests with common and standard nails used in the construction of wooden palettes. Even the heaviest and thickest steel drums, emptied, only with the tare, of 1.2 mm and 200 litres of capacity do not pass the puncture test with nails of 10 cm height. This must make us realize that a steel drum completely full of product and placed on a wooden palette can be punctured by a nail strongly fixed and with a length that surpasses the height of the drum or mechanical chime, mainly if there is another packaging stacked over it, as it usually happens.

3. It is proposed to do some puncture tests with standard packagings. These tests could be done with a bar 6 kilos weight, 3.2 cm diameter, hemispherical end and at a height of drop of 1.7 metres (see 6.4.15.6 of UN Recommendations for Class 7 packagings B (U) and B (M)) or with a bar with different features (such as weight) and as a consequence of it at a different height. In both cases the packaging should be full of water to reproduce the situation of a packaging loaded with liquids and also to facilitate the observation of the leakage of the specimen.

4. Once the tests above mentioned have been done, we can decide the ideal puncture test for the following two levels of packaging capacity:

- 100 litres or above;
- Between 20 and 100 litres.

A capacity below 20 litres should not be considered in the puncture test because it directly affects most of the light weight packaging, which in the RID and ADR have different testing conditions.

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