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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**  
(Nineteenth session, 2-6 July 2001,  
agenda item 5(a))

**PACKAGINGS**

**Performance testing**

**Draft ISO/CEN Standard for Package Testing – Problems of interpretation with Chapter 6.1**

**Transmitted by the International Standards Organization (ISO)**

**Background**

1. During the December 1999 session of the Sub-Committee of Experts on the Transport of Dangerous Goods, the secretariat circulated copies of draft document ISO/EN16104 which is intended to supplement the provisions of UN Chapter 6.1.5 by clarifying and standardising the approach to testing packagings to be used for the carriage of dangerous goods.
2. In April 2000 at the close of the comment and preliminary voting period for this draft standard, there were over 350 comments from 24 countries. The preliminary votes both at ISO and CEN showed over 80% support for the standard – only three countries voted against it. In September 2000, the joint ISO/CEN working group met in Vienna and considered all the comments. During that meeting a number of issues were raised that needed to be brought to the attention of the UN Committee of Experts for comment/decision. The working group met again in November 2000 and finalised its work on this draft standard.

3. In an informal paper (INF.22), the expert from the United Kingdom – on behalf of the ISO/CEN working group – brought these issues to the attention of the Committee at its 21st session in December 2000 and made a number of proposals to resolve some of the issues. However, several experts entered a reservation of principle regarding such a procedure, since the proposals were new, had not first been submitted to the Sub-Committee and were not in the form of an official document. Following a number of exchanges on the nature of each of the proposals, the United Kingdom paper was withdrawn, but written comments were requested prior to submission of an official proposal in the next biennium.

4. The ISO/CEN working group met again in Chicago in April 2001 when the final draft standard had been submitted for voting. The outcome of the vote should be known in December 2001. The working group reiterated its concerns over the issues raised. The ISO secretariat was asked to forward a corresponding official document to the Sub-Committee for consideration at the nineteenth session in July 2001. The proposals set out in this document are intended to guide the Sub-Committee towards possible solutions rather than being the definitive view of the working group at this stage.

5. The Working Group, has identified certain problems in the current wording of the UN Model Regulations on package testing requirements that should be addressed in this biennium.

6. This document is in two parts.

First: four specific proposals are made on points that the working group generally believe are clarifications that would help interpretation of the text in the Model Regulations.

Second: there are three issues on which the working group was divided and is seeking the views of the Sub-Committee.

## PROPOSALS FOR ADOPTION

### Proposal 1

#### **6.1.5.2 Preparation of packagings for testing**

Paragraph 6.1.5.2.1 requires packagings for liquids to be filled to 98% of their maximum capacity and those for solids to be filled to 95%. Flexible packagings such as bags cannot be measured to 95%. During its discussion in December 1999 on a document submitted by ICIBCA on use of the terms “fill” and “load” in Chapter 6.5, the Sub-Committee recognised that flexible IBCs would have to be filled to the level of intended use by the designer or user as they cannot be measured to 95%. The same proviso should be applied to flexible packagings.

*Proposal:* After the second sentence of 6.1.5.2.1 add:

“Bags shall be filled to the mass at which the packaging is intended to be used.”

### Proposal 2

#### **6.1.5.3 Drop test**

Following a number of incidents some years ago, certain countries impose a delay between filling and dropping removable head packagings for liquids as instances of gasket relaxation can be shown after a period of about 24 hours. The draft standard contains a condition to this effect.

*Proposal:* Add a new 6.1.5.3.3 as follows:

“6.1.5.3.3 Removable head packagings for liquids shall not be dropped until at least 24 hours after filling to allow for any possible gasket relaxation.”

Subsequent sections would have to be renumbered.

### **Proposal 3**

#### **6.1.5.3.4 Anti-freeze mixtures for cold drop tests**

The Model Regulations provide for the use of water, with a relative density of 1, as test contents when testing packagings. Normally a water glycol mixture with a relative density of 1.08 is used for plastics packaging to prevent freezing when undertaking the drop test at  $-18^{\circ}\text{C}$ . It had been thought that the drop heights could therefore be less than those specified in 6.1.5.3.4 (a) to take account of the differing relative density, as is the case in 6.1.5.3.4(b). The working group, however, considered that the minimum drop heights for PG I, II and III should remain at 1.8m, 1.2m and 0.8m, respectively. The draft standard includes a note that :

“The term water includes water/antifreeze mixtures for testing at  $-18^{\circ}\text{C}$ .”

*Proposal:* Include this note at the end 6.1.5.3.4

### **Proposal 4**

#### **6.1.5.7 Cooperage Test**

The working group considered that the test in 6.1.5.7 should not be included in the draft standard as no testing body had ever carried out such a test. Furthermore, some doubt was expressed as to whether the test was realistic. In the light of the UN Committee's decisions only to permit wooden barrels under very limited circumstances e.g. P001 PP2, SP247, and then to exempt them from UN testing, the Sub-Committee might consider deleting this text as well as the provisions in 6.1.4.6

*Proposal:* Delete 6.1.4.6 and 6.1.5.7

Since this would remove wooden barrels as a means of packaging dangerous goods, further consequential amendments would be needed as follows:

SP 247. Remove reference to Chapter 6.1 by deleting the phrase "deviating from the requirements..... of chapter 6.1".

P001, PP2: Delete the text in brackets.

## Chapter 6.1

6.1.2.5 " 2 wooden barrel". Delete and replace with "Reserved".

6.1.2.7 " 2 Barrels". Delete and replace with "Reserved".

Renumber 6.1.4.7 as 6.1.4.6 and so on in 6.1.4,

Renumber 6.1.5.8 as 6.1.5.7.

### **FURTHER POINTS FOR CONSIDERATION**

The Sub-Committee is further asked to consider the following points. The ISO/CEN working group has been divided over interpretation and before considering them further seeks the view of the Sub-Committee.

#### **6.1.5.1 Performance and frequency of tests (Design types)**

6.1.5.1.2 defines design type and includes the phrase "but may include various surface treatments". This phrase is saying that if a coating is placed inside a drum, providing other factors such as dimensions, material of manufacture, etc. are unchanged, further testing is not required.

6.1.5.1.9 states "If an inner coating is required for safety reasons, it shall retain its protective properties even after the tests."

There appears to be a conflict between these two paragraphs. 6.1.5.1.2 indicates that the tester does not have to take coatings into account, but 6.1.5.1.9 requires that any coating remains in place after tests. The working group was unanimous that coatings were not addressed in normal testing. The number of potential tests could be enormous if every coating had to be assessed. The working group felt that the object of 6.1.5.1.9 is already addressed in 4.1.1.2.

*Possible proposal:* Delete 6.1.5.1.9

#### **6.1.5.3.4 Adjustment of the drop height**

6.1.5.3.4 provides for certain drop height adjustments. The working group debated several times adjusting drop heights for combination packagings. Some members interpret the current text as only applying to single packagings, eg. drums for liquids. The argument is that because the result of the testing leads to an "S" in the mark, combination packagings should be viewed as packagings intended to contain solids. Others believe the drop height should be adjusted in accordance with these principles on every occasion. 6.1.5.3.4 is therefore open to interpretation. The text was originally derived from that for single packagings.

*Possible proposal:* Replace in 6.1.5.3.4 the sentence "For liquids if the test is performed with water:" with:

"For liquids in single packagings and for inner packagings of combination packagings, if the test is performed with water:"

**Partially filled packages**

The chemical industry is developing packaging methods associated with various production processes where the packagings are only partly filled with a substance, sometimes as low as 50% of the normal filling ratio. Such procedures are not uncommon for drums intended to enable mixing of other constituents on site, but also apply to inner packagings of combination packagings. A few years ago, some research was carried out in the field on partially filled drums. The results showed that drums filled to less than 70% of their brimful capacity were more likely to fail the performance tests.

Where industry wants to use partially filled drums, should the tests reflect actual use in accordance with the first sentence of 6.1.5.2.1 - "Tests shall be carried out on packagings as prepared for transport..." ? Or should all testing be carried out at the 95%/98% levels?

If the Sub-Committee considers that this practice should be addressed in the Model Regulations, a proposal will be prepared to amend 6.1.5.2.1 to reflect it.

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