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Sub-Committee of Experts on the Transport of Dangerous Goods
(Nineteenth session,
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PACKAGINGS (INCLUDING IBCs AND LARGE PACKAGINGS)

Performance testing

Transmitted by the Expert from the United States of America

1. This paper is submitted for the purpose of commenting on the proposals in ST/SG/AC.10/C.3/2001/24 (ISO) and to provide comments on whether existing packaging performance test requirements in the UN Recommendations should be replaced by references to ISO standards (see paragraph 3). Comments on proposals 1 through 4 of the ISO paper are provided as follows:

Proposal 1 – The expert from the United States supports the proposal to amend 6.1.5.2.1 to address the filling of bags for testing with the exception that the word "maximum" should be inserted before the word "mass" in the proposed sentence. The text would read, "Bags should be tested to the maximum mass at which they may be used."

Proposal 2 – The expert from the United States believes that further justification is needed before deciding to require a 24 hour gasket relaxation period. Nevertheless, we recognize that gasket relaxation can and does contribute to leaking packages in transport. For instance, in a recent enforcement case certain open head drums failed test conducted at our government test lab. The drum manufacturer contributed the failure to gasket "set" during the time between manufacture and testing (several months). We agree that gasket relaxation needs to be considered in the performance testing of packagings. This issue is related to the concerns we have raised both at previous Sub-Committee meetings and at the ICAO Dangerous Goods Panel. We support further consideration of this issue by the Sub-Committee.

Proposal 3 – We agree with the intent of the proposal. The expert from the United States agrees that the use of water antifreeze solutions is already authorized in the Model Regulations. Based on the text in paragraph 6.1.5.3.2 where the use of antifreeze for conducting the -18 ^{o}C drop test is authorized and paragraph 6.1.5.2.2 where it is indicated that "when another substance is used, it shall be of ***similar*** relative density and viscosity to those of the substance being transported" the Model Regulations authorize the use of aqueous antifreeze solutions that have a specific gravity approximately equal to 1.0. In paragraph 6.1.5.2.2 the word ***similar*** is intended to allow a certain tolerance. The ISO proposal fails to resolve the ambiguity with respect to which water antifreeze solutions can be used.

Some test labs use salt solutions that are rather dense (e.g. calcium chloride S.G –1.24). Others use aqueous solutions of ethyl alcohol and methanol in ratios that provide a specific gravity of 1 or slightly less. To illustrate the types of antifreeze solutions that are being used by test labs the following data is provided (based on tables in Lange's Handbook of Chemistry):

Ethyl Alcohol - 34% Density = 0.95
Methyl Alcohol - 25% Density = 0.96
Ethylene Glycol - 40% Density = 1.05
Propylene Glycol - 40% Density = 1.03
Glycerol - 50% Density = 1.13
Magnesium Chloride 25% Density = 1.23
Sodium Chloride - 23% Density = 1.18
Calcium Chloride - 25% Density = 1.24

As an alternative to the ISO proposal, the Sub-Committee should consider a lower limit for aqueous solutions containing antifreeze that would allow the use of the common types currently being used by test labs. On this basis, the proposal by ISO would be amended to:

"The term water includes water/antifreeze solutions with a minimum specific gravity of 0.95 for testing at –18 ^{o}C."

Proposal 4 -The expert from the United States supports proposal 4 to remove the wooden drum requirements.

2. The following comments apply to the points for further consideration that are raised in the ISO paper:

Coatings The US does not agree that there is a contradiction between 6.1.5.1.9 and 6.1.5.1.2. Paragraph 6.1.5.1.9 states specifically that the coating is for safety purposes. The coating must hold up under testing if it is necessary for safety. A purely cosmetic coating or one that may prevent long-term corrosion does not have to survive the performance tests. This is entirely dependent on the substance being transported in the packaging. Some products are aggressive and will find any crack or imperfection in the lining. Other products will not attack the damaged lining but will be contaminated by the iron or iron oxides in the substrate. The expert from the United States does not support this proposal.

Adjustment of drop height -The expert from the United States supports the proposed amendment to 6.1.5.3.4.

Partially filled packages - The expert from the United States recognizes that it is common practice to transport partially filled packagings. We do not believe that it is practical or reasonable to test every possible filling variation for a given packaging. We do not support option 1 in the ISO proposal (i.e. tests should reflect actual use –filling as prepared for transport). We do not believe it would be pragmatic to conduct tests on packagings in every potential filling scenario. This approach would significantly increase the number of test required. We recognize that there will be some variation in the performance of a packaging on the basis of the filling conditions, however we do not agree that the performance tests need to simulate all filling conditions. We support the current requirement in the UN Model Regulations as indicated in option 2 of the ISO proposal (i.e. the current 95%/98% filling levels).

Incorporation of ISO 16104 in the Model Regulations

3. The expert from the United States is concerned with statements made by ISO, members of the ISO/CEN working group and members of the Committee of Experts during the 21st session, specifically with respect to replacing existing UN performance oriented packaging requirements with a reference to ISO standards. The UN performance test requirements affect millions of people throughout the world including shippers, packaging manufacturers, test laboratories, enforcement officials, etc. For example, it is the shipper's responsibility to ensure that dangerous goods packagings are able to withstand the performance tests. Should we require every shipper to purchase a copy of the ISO standard to ensure

compliance with the Model regulations? This performance requirements are a major core component of the UN Recommendations and should not be replaced by a reference to a standard. While in other cases the UN Transport Sub-Committee has adopted ISO standards in lieu of inserting text in the Recommendations, this situation is different because of the number of people that rely on having the text in the Recommendations and because the packaging tests apply to the majority of dangerous goods transported in quantities less than 450 litres per packaging. While the US generally supports the concept of incorporating consensus standards into the Model Regulations for certain purposes (e.g. flash point testing, cylinder design, etc.), it does not agree that it would be in the best interest of the Sub-Committee or worldwide transport safety to replace existing packaging test requirements with a reference to an ISO standard.

We do not oppose referencing the standard for information purposes (e.g. adding a statement *"ISO 16104 provides guidance and information that may be useful in conducting the tests in 6.1.5"*) provided they provide a level of safety consistent with that afforded by the Model Regulations. We believe some of the informative provisions in the standard may be useful for test laboratories to ensure consistency in test reports and other specifics relative to the testing procedures.

Even though the performance test requirements are fairly mature, there is a need to make changes to the requirements from time to time to address safety concerns or to provide clarifications for users of the requirements. This concern is substantiated by the number of proposals submitted to this meeting, the number and content of the packaging proposals considered recently by ICAO and the work items for the current biennium on vibration testing and other packaging matters. If the current performance testing requirements were removed from the UN Recommendations, amendments to the requirements would take much longer to bring into force, be more difficult to make because ISO is a consensus body and some affected groups would not be capable of participating in the deliberations. The make-up of the CEN/TC 261/SC5/WG is primarily comprised of packaging lab personnel that have certain vested interests and view points that differ from those of other parties affected by the UN performance tests. Delegating responsibility for the performance tests chiefly to this group would compromise the likelihood that the concerns of all affected parties would be taken into account. It would hamper the ability for these other parties to participate in revisions to the requirements. Safety could ultimately be compromised. Modal agencies and national authorities may be forced to adopt exceptions to the standard or to deviate from it and this would lead to disharmony. The Transport Sub-Committee would lose direct control over the amendments and members of the Sub-Committee would be forced to attend additional meetings.

There are also a number of other technical differences in the draft ISO performance testing standards that cause serious concern if there is an intention to replace the packaging performance requirements in the UN Recommendations. The expert from the United States believes that the Sub-Committee needs to be aware of these differences and to consider how other differences could eventually and most probably be introduced if it were to relinquish its control over the packaging requirements to ISO or any other standards body. We believe that if there are changes or corrections to be made to the packaging requirements in the Model Regulations the changes, corrections, clarifications and justifications should be submitted for consideration and decided by the UN Transport of Dangerous Goods Sub-Committee.

Differences that exist in the draft ISO/CEN standard 16104 that are not in the UN Model Regulations and were not proposed by ISO include:

a) Section 3.10 of the standard includes a reference to light gauge metal packaging that is not referenced in the Model Regulations and that has test requirements that are different from the requirements for UN packaging; and

(b) The standard does not include a water resistance test for fibreboard which is a test (Cobb test) required in the Model Regulations in section 6.1.4.12.1.

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