

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

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PACKAGINGS (including IBC's and large packagings)

Comments on UN/SCETDG/28/INF.5 (Report of the Informal IBC Working Group)
leakproofness test; limitation of deformation

Transmitted by the expert from Germany

The working group discussed the introduction of an additional test criterion for the leakproofness test in form of a maximum permanent deformation. 3% of the initial external dimensions are given in the report as a preliminary figure in square brackets.

The expert from Germany hereby repeats his concerns with respect to this idea and underlines his belief that permanent deformation and leakproofness are not correlated. Leakproofness is a result of a proper fitting of components and completeness of walls.

It was pointed out during the Paris meeting, that limitations of deformations are considered to be part of the pressure design and not of the leakproofness test. The expert from Germany announced the submission of an adequate proposal for amendment of the hydraulic test, deemed to provide for a limitation of permanent deformations under normal conditions of transport.

Proposal

It is proposed to introduce an additional test level for the hydraulic test, some kind of a maximum allowable working pressure representing normal conditions of transport. This additional test level would need to be performed prior to the existing hydraulic test and shall be combined with a test criterion in form of maximum permanent deformations (leakproofness is also required).

The height of the pressure as well as the allowable permanent deformation need to be discussed.

20 kPa (gauge) are proposed as test level. This pressure is related to the maximum vapour pressure of substances, allowed to be carried in composite IBC's (110 kPa abs. at 50°C) together with a contribution of the air volume enclosed in the ullage of the IBC.

With respect to the deformation criterion, a limitation is proposed, which characterises normal conditions of transport, including stacking, loading and unloading of closed vehicles or box containers. The condition of the IBC after the test should allow for the continued use of the IBC under normal conditions of transport.

It's understood that ICCP would be prepared to examine existing design types in order to derive a realistic figure for allowable deformations, representing the state of the art.

Explanation

The pressure design of composite IBC's is regulated by UN 4.1.1.10 which specifies maximum vapour pressures of filling substances in relation to the hydraulic test pressure, including a safety factor. By this provision normal conditions of transport are correlated with the test condition. However, the test criterion "no permanent deformation which would render the IBC unsafe for transport..." as it is generally interpreted by test houses does not include normal conditions of transport but a deformation which would allow the rescue of a globally deformed IBC without leakage only.

This is why 4.1.1.10 is misleading. It relates service and test conditions without indicating of what is acceptable at internal pressures at the upper limit of service conditions.

If it is state of the art of IBC testing that global deformations are acceptable as result of the present hydraulic test which render the IBC unsuited for further use, then an additional test level together with an adequate criterion is indispensable.

It is assumed that this concept will be capable of replacing similar approaches to introduce deformations under the leakproofness test.
