

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

30 November 2015

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Item 7 of the provisional agenda

Global harmonization of transport of dangerous goods regulations with the Model Regulations

Outcome of the Working Party on the Transport of Dangerous Goods on its ninety-ninth session

Note by the secretariat

During its ninety-ninth session, the Working Party on the Transport of Dangerous Goods requested the secretariat to bring the following issue to the attention of the Sub-Committee (ref. paragraph 28 of the report of the Working Party ECE/TRANS/WP.15/230:

The Working Party would like the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods to check the use of the terms “liquid phase” and “liquid component” in the wording of packing instruction P200 (3) (e). Especially in the last sentence and in (vi) where the subject is the same but the wording used is different.

- “(e) For liquefied gases charged with compressed gases, **both components** – the **liquid phase** and the compressed gas – have to be taken into consideration in the calculation of the internal pressure in the pressure receptacle. The maximum mass of contents per litre of water capacity shall not exceed 0.95 times the density of the **liquid phase** at 50 °C; in addition, the **liquid phase** shall not completely fill the pressure receptacle at any temperature up to 60 °C.
- When filled, the internal pressure at 65 °C shall not exceed the test pressure of the pressure receptacles. The vapour pressures and volumetric expansions of all substances in the pressure receptacles shall be considered. When experimental data is not available, the following steps shall be carried out:
- (i) Calculation of the vapour pressure of the **liquid component** and of the partial pressure of the compressed gas at 15 °C (filling temperature);
 - (ii) Calculation of the volumetric expansion of the **liquid phase** resulting from the heating from 15 °C to 65 °C and calculation of the remaining volume for the **gaseous phase**;
 - (iii) Calculation of the partial pressure of the compressed gas at 65 °C considering the volumetric expansion of the **liquid phase**;
NOTE: The compressibility factor of the compressed gas at 15 °C and 65 °C shall be considered.
 - (iv) Calculation of the vapour pressure of the **liquid component** at 65 °C;
 - (v) The total pressure is the sum of the vapour pressure of the **liquid component** and the partial pressure of the compressed gas at 65 °C;
 - (vi) Consideration of the solubility of the compressed gas at 65 °C in the **liquid phase**;
- The test pressure of the pressure receptacle shall not be less than the calculated total pressure minus 100 kPa (1bar).
- If the solubility of the compressed gas in the **liquid component** is not known for the calculation, the test pressure can be calculated without taking the gas solubility (sub-paragraph (vi)) into account.”