

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 Globally Harmonized
System of Classification and Labelling of Chemicals

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Item 2 (h) of the provisional agenda

Classification criteria and related hazard communication:

Other issues

Classification of physical hazards according to the GHS: Which combinations/cross-classifications are possible and can be assigned to chemicals?

Transmitted by the expert from Germany

1. One of the fundamental principles of the GHS is that all hazards of a chemical should be assigned and communicated. There is no general prioritization of hazards in the sense that certain hazard classes are not applicable if another one has been assigned. In contrast to health and environmental hazards, there are physical or chemical factors which preclude certain combinations of physical hazard classes. So far, there is no common understanding as to which combinations are relevant and which not. For example, should a pyrophoric liquid be classified as flammable liquid in addition, or is this redundant and unnecessary? In the course of the implementation of the GHS by countries or sectors and the actual application by industry all over the world, such questions become more and more important.

2. For some of the combinations the GHS provides an answer, in one way or another: Some combinations are not possible due to the physical state associated with the hazard class and some are explicitly excluded by according text or notes in the GHS. But other combinations of physical hazard classes are not mentioned although the relevance of their combination might be debatable and thus might be applied differently all over the world.

3. The experts from Germany have intensely discussed the question of cross-classifications and considered systematically all possible combinations of physical hazard classes. The discussions resulted in a cross-table in which the combinations of physical hazard classes are assessed with regard to their possible applicability. Colors were assigned to all combinations as follows:

- Combinations marked in red are undoubtedly not possible, either due to the physical state or based on explicit information in the GHS.
- Combinations marked in orange are not possible, e.g. due to restrictions related to the interpretation of test results or execution of the test methods or such combinations should be precluded, e.g. for safety reasons. However, this is not stated in the GHS.
- Combinations marked in yellow might be possible or are actually assigned in some (special) cases although there might be practical problems because the criteria/test methods of one of the hazard classes cannot be applied properly due to properties associated with the other hazard class.

- Combinations marked in green are possible and must be considered when classifying a chemical.
4. This cross-table and the underlying considerations have been published as follows: "UN-GHS Physical hazard classifications of chemicals: A critical review of combinations of physical hazard classes" Journal of Chemical Health & Safety 24(6), 15-28 (2017). The article is available online under <https://authors.elsevier.com/a/1VwbQ6fYhmiWTm>. Until mid of December 2017 the article it can be freely downloaded, after that it can be purchased normally. For ease of reference the pre-print of the manuscript is attached as annex to this document.
 5. The assessment as summarized in the cross-table (Table 1 in the above-mentioned publication) shows that there is a comparatively large number of combinations for which an unambiguous decision based on the GHS is not possible (orange and yellow combinations).
 6. As one additional milestone on the path to a globally harmonized system for the classification of chemicals, the question of cross-classification of physical hazards should be discussed and ultimately solved on a global basis. Therefore, the Sub-committee is invited to consider the issue. The expert from Germany would be happy to assist the process should the Sub-Committee decide that this subject should be pursued, that clarification is deemed helpful and/or that information to that regard should be added to the GHS.

Annex

The publication is available online under <https://authors.elsevier.com/a/1VwbQ6fYhmiWTm>

For ease of reference the pre-print of the manuscript is attached in the following.



GHS-Physical-hazar
ds_Combinations_1:
