



**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****Twenty-fourth session**

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Item 2 (a) of the provisional agenda

**Updating of the Globally Harmonized System of
Classification and Labelling of Chemicals (GHS):
Physical hazards****Editorial corrections to Chapter 2.3: Aerosols****Transmitted by the expert from Sweden¹****Introduction**

1. In the fourth revised edition of the GHS, a substantial change was introduced in Chapter 2.3, namely the inclusion of non-flammable aerosols as Category 3. Consequentially, the title of the Chapter was changed from “Flammable aerosols” to “Aerosols”, and some further consequential amendments were also made to the GHS.
2. At the 23rd session of the Sub-Committee, Sweden proposed a number of further editorial corrections to the texts in Chapter 2.3 in informal document INF.7. (The document was also submitted to 41st session of the Sub-Committee of Experts on the Transport of Dangerous Goods as INF.11.)
3. While the amendments proposed in INF.7 were in principle accepted by the Sub-Committee, the Secretariat raised concerns that further amendments may be needed in order to clarify that Chapter 2.3 of the GHS only considers the flammability and pressure hazards of aerosols, and that NOTE 2 of paragraph 2.3.2.1 applies to all aerosols (see report from the 23rd session of the Sub-Committee, ST/SG/AC.10/C.4/46, paragraph 29).

¹ In accordance with the report of the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals at its twenty-third session (ST/SG/AC.10/C.4/46, par. 29).

4. Sweden was invited to look further into the matter, and to return with a formal document, comprising all necessary amendments to Chapter 2.3, to the 24th session of the Sub-Committee. This is that formal document.

Problem

5. Some amendments following the changed scope of Chapter 2.3 appear to have been missed, and this should be corrected with the fifth revised edition of the GHS. Such is the case for paragraph 2.3.2.1, for the title to Table 2.3.1, for the introductory text in paragraph 2.3.4.1 and for the title of decision logic 2.3(a). Furthermore, paragraph 2.3.2.1 is inconsistent with the actual classification criteria as given in decision logic 2.3 (a), which should also be corrected.

6. Most of the current inconsistencies are due to the term “flammable aerosol”, which has been retained from Rev. 3 of the GHS but has become unclear with the introduction of Category 3 and the consequential change of the chapter scope and title. The term “flammable aerosol” in the GHS corresponds (exactly) to what is now Categories 1 and 2 in the hazard class “Aerosols”. However, in paragraph 2.3.2.2 it refers only to Category 2, which is, in turn, consistent with the denotations used in the test methods in Section 31 of the Manual of Tests and Criteria. In order to keep the connection to the terminology used in the test methods but avoid confusion, the terms “extremely flammable aerosol”, “flammable aerosol” and “non-flammable aerosol” should preferably be kept in brackets in paragraph 2.3.2.2, but be avoided elsewhere in the GHS in favour of the GHS terms “Category 1”, “Category 2” and “Category 3”, respectively.

7. The classification criteria in paragraph 2.3.2.1 only refer to the flammable aspect of aerosols, which may be misread as meaning that the criteria are not relevant to classifying aerosols in Category 3 (“non-flammable aerosols”). Since Note 2 is under this particular paragraph, this may, in turn, lead to the interpretation that Category 3 aerosols do not have to be classified for potential health and environmental hazards. This is clearly not the intention.

8. As written, paragraph 2.3.2.1 states that an aerosol that contains a flammable component in any amount should be considered for classification as “flammable”, i.e. considered for classification as Category 1 or 2. However, as reflected in decision logic 2.3(a) there is actually a threshold of 1% (by mass) (see argumentation below) on the content of flammable components for an aerosol to be considered as Category 1 or 2. This threshold is not reflected in paragraph 2.3.2.1, which it naturally should be.

9. Furthermore, the criterion on the heat of combustion for classification into Category 3, as reflected in decision logic 2.3 (a), is missing in the text of paragraph 2.3.2.1. Also an aerosol that does not contain any of the listed flammable components could be classified in Category 1 or 2, if its heat of combustion is 20 kJ/g or more. This needs to be included in the text of paragraph 2.3.2.1.

10. Additionally, the order of the flammable components listed in paragraph 2.3.2.1 should preferably and logically follow the order of the Chapters in the GHS, i.e. Chapter 2.2 (flammable gases); 2.6 (flammable liquids); 2.7 (flammable solids).

11. The title to Table 2.3.1 currently reads “Label elements for flammable and non-flammable aerosols”. However, to be consistent with how the titles of the corresponding tables in other chapters of the GHS are written, this title should reflect the name of the hazard class (i.e. the title of the chapter). Furthermore, the unclear term “flammable aerosols” is used, which should be avoided (see argumentation above).

12. In the introductory text to the decision logics, paragraph 2.3.4.1, it is stated that classification as a flammable aerosol requires information on its flammable components

and chemical heat of combustion. However, it is clear from decision logic 2.3 (a), as well as from the text in paragraph 2.3.2.2, that also to classify an aerosol as Category 3 (i.e. as a “non-flammable aerosol”), data on flammable components and heat of combustion is needed. Furthermore, here again the wording “flammable aerosol” appears, which should be avoided (see argumentation above).

13. Decision logic 2.3(a) clearly includes also Category 3 aerosols (i.e. “non-flammable aerosols”), and therefore the heading should be amended to reflect this fact. Furthermore, here again the wording “flammable aerosol” appears, which should be avoided (see argumentation above). The decision logic also does not express what the percentage refers to, mass or volume, which should be clarified. According to special provision 63 in Chapter 3.3 of the Model Regulations it is by mass.

Proposals

14. The following changes are proposed, where text to be deleted is in bold strike-through and new text is in bold underline. Clean versions of the texts as amended can be found in the Annex to this document.

- (a) Change the text of paragraph 2.3.2.1 (Note 1 and 2 should be retained as they are):

“Aerosols are classified in one of the three categories of this hazard class, depending on their flammable properties and their heat of combustion. They should be considered for classification as flammable in Category 1 or 2 if they contain more than 1% any components (by mass) which ~~is~~ are classified as flammable according to GHS criteria, i.e.:

Flammable ~~liquids gases~~ (see Chapter ~~2.6 2.2~~);

Flammable ~~gases liquids~~ (see Chapter ~~2.2 2.6~~);

Flammable solids (see Chapter 2.7);

or if their heat of combustion is at least 20 kJ/g.”

- (b) Change the title of Table 2.3.1:

“Table 2.3.1: Label elements for ~~flammable and non-flammable~~ aerosols”

- (c) Change the first part of the first sentence of paragraph 2.3.4.1:

“To classify an aerosol ~~as a flammable aerosol~~, data on its flammable components, on its chemical heat of combustion and, if applicable, the results of the foam test (for foam aerosols) and of the ignition distance test and enclosed space tests (for spray aerosols) are required. Classification should be made according to decision logics 2.3 (a) to 2.3 (c).”

- (d) Change the heading of decision logic 2.3(a):

“Decision Logic 2.3 (a) for ~~flammable~~ aerosols”

- (e) Change the text of the left middle box of decision logic 2.3 (a):

“Does it contain $\leq 1\%$ flammable components (by mass) and does it have a heat of combustion < 20 kJ/g?”

- (f) Change the text of the left bottom box of decision logic 2.3 (a):

“Does it contain $\geq 85\%$ flammable components (by mass) and does it have a heat of combustion ≥ 30 kJ/g?”

Annex

A “clean” version of the texts as amended in the proposals under paragraph 14 is presented here, in order to facilitate reading:

(a) Paragraph 2.3.2.1:

“2.3.2.1 Aerosols are classified in one of the three categories of this hazard class, depending on their flammable properties and their heat of combustion. They should be considered for classification in Category 1 or 2 if they contain more than 1% components (by mass) which are classified as flammable according to GHS criteria, i.e.:

Flammable gases (see Chapter 2.2);

Flammable liquids (see Chapter 2.6);

Flammable solids (see Chapter 2.7);

or if their heat of combustion is at least 20 kJ/g.”

NOTE 1: Flammable components do not cover pyrophoric, self-heating or water-reactive substances and mixtures because such components are never used as aerosol contents.

NOTE 2: Aerosols do not fall additionally within the scope of chapters 2.2 (flammable gases), 2.5 (gases under pressure), 2.6 (flammable liquids) or 2.7 (flammable solids). Depending on their contents, aerosols may however fall within the scope of other hazard classes, including their labelling elements.”

(b) Title of Table 2.3.1: “Table 2.3.1: Label elements for aerosols”

(c) Paragraph 2.3.4.1:

“To classify an aerosol, data on its flammable components, on its chemical heat of combustion and, if applicable, the results of the foam test (for foam aerosols) and of the ignition distance test and enclosed space tests (for spray aerosols) are required. Classification should be made according to decision logics 2.3 (a) to 2.3 (c).”

(d) Heading of decision logic 2.3(a): “Decision Logic 2.3 (a) for aerosols”

(e) Middle left box of decision logic 2.3 (a):

“Does it contain $\leq 1\%$ flammable components (by mass) and does it have a heat of combustion < 20 kJ/g?”

(f) Bottom left box of decision logic 2.3 (a):

“Does it contain $\geq 85\%$ flammable components (by mass) and does it have a heat of combustion ≥ 30 kJ/g?”
