

**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals**

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**Sub-Committee of Experts on the Transport of  
Dangerous Goods**

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Item 10 (h) of the provisional agenda

**Issues relating to the Globally Harmonized  
System of Classification and Labelling of  
Chemicals: miscellaneous**

**Sub-Committee of Experts on the Globally Harmonized  
System of Classification and Labelling of Chemicals**

**Thirtieth session**

Geneva, 9-11 December 2015

Item 2 of the provisional agenda

**Joint work with the Sub-Committee of Experts on the  
Transport of Dangerous Goods (TDG Sub-Committee)**

**Use of the Manual of Tests and Criteria in the context of the  
GHS: Proposed amendments to Chapter 31 of Part III of the  
Manual**

**Transmitted by the expert from Canada**

1. Reference is made to document UN/SCETDG/45/INF.8/Add.4-UN/SCEGHS/27/INF.5/Add.4 and UN/SCETDG/47/INF.31-UN/SCEGHS/29/INF.9 from the 45th and 47th sessions (respectively) of the Sub-Committee.
2. This document contains specific comments on the suggested amendments to Section 31 of Part III of the Manual of Tests and Criteria.
3. As highlighted in paragraph 4 of INF.31 (47th session), any reference to both the Model Regulations and GHS should always place the Model Regulations before the GHS for consistency purposes. In the introduction to the Manual, the Model Regulations are presented first and this should be maintained throughout. Constant references to “transport” classes and “GHS” categories are redundant and should be deleted.
4. The goal of Chapter 31 is to determine whether the aerosols are flammable or not. It is thus suggested to keep the reference to the concept by amending the title of this chapter as seen below. It also is proposed to remove the reference to “transport class 2” in the title and to incorporate the references to the UN Model Regulations and the GHS into 31.1.1 as follows.

**Classification procedures, test methods and criteria relating to  
flammability of flammable aerosols (transport class 2)**

**31.1 Purpose**

31.1.1 This ~~chapter section~~ presents the United Nations scheme for the classification of ~~flammable~~ aerosols as either flammable (Division 2.1 / Category 1 or 2) or non-flammable (Division 2.2 / Category 3). The text should be used in conjunction with the classification principles given in Chapters 2.2 and 3.3 (special provision 63) of the Model Regulations, Chapter 2.3 of the GHS, the flow charts given in figures

31.1, 31.2 and 31.3 and the tests prescriptions given in sub-sections 31.4, 31.5 and 31.6 of this Manual.

5. Keeping the same direction as mentioned above, it is proposed to adopt the changes proposed to sub-section 31.1.2 of the Manual in INF.5/Add.4 (45<sup>th</sup> session) and to add the word “flammability” to address the real goal of this chapter.

31.1.2 The test procedures outlined here adequately assess the flammability relative hazards of ~~flammable~~ aerosols so that an appropriate classification can be made.

6. In 31.1.3, it is unnecessary to specify that the Model Regulations are for transport as this is already explained in the introduction to the Manual. Thus it is proposed to drop the proposed amendment in INF.8/Add.4 (45<sup>th</sup> session).

7. Also in 31.1.3, the definition for Flammable components states that certain “components are never used as aerosol contents”. It is proposed to replace this with “should never be” as this is an implied safety requirement. The same statement is used in NOTE 1 under 2.3.2.1 in the GHS and any change in the Manual should also be reflected in the GHS.

*Flammable components* are flammable liquids, flammable solids or flammable gases and gas mixtures. This designation does not cover pyrophoric, self-heating or water-reactive substances and mixtures because such components should never be ~~are never~~ used as aerosol contents.

8. The expert from Canada believes that a new sentence should be added to 31.2.1 to include the GHS reference properly. It is also proposed to remove the word “dispensers” from the note in 31.2.1 as aerosols are designated throughout only as aerosols as such and not as aerosol dispensers (except in its definition). The note under 2.3.2.2 in GHS also only uses the term “aerosols”. The last sentence is unnecessary as this is already highlighted in the introduction to the Manual.

31.2.1 Aerosols shall be subjected to the classification procedures as set out in special provision 63 of Chapter 3.3 of the Model Regulations. Aerosols for supply and use shall be subjected to the classification scheme as set out in 2.3.2 of the GHS. For flammability, aerosols shall be subjected to the classification procedures as set out in this section. ~~The classification procedure shall be undertaken before a new product is offered for transport.~~

*NOTE: Aerosols ~~dispensers~~ not submitted to flammability classification procedures in this sub-section shall be classified as extremely flammable (GHS-Category 1).*

9. Regarding the classification procedure, there is no definition for Category 2 in 31.3.1 and it is proposed to include one. It is also proposed to remove the criteria in 31.3.2 and 31.3.4 and to keep only the “chapeau” (with the proper reference in 31.3.2 for sub-section 31.4) as the criteria is explained in the referenced 31.4 and 31.6 respectively, as well as changing “criteria” for “procedure” in 31.3.5.

### 31.3 Classification procedure for ~~flammable~~ aerosols

31.3.1 Aerosols shall be classified as non-flammable, flammable or extremely flammable according to their heat of combustion and to their flammable component contents, as follows:

- (a) The aerosol ~~product~~ is classified as extremely flammable (Division 2.1 / Category 1) if ~~it the product~~ contains 85% or more flammable components (by mass) and the chemical heat of combustion exceeds or is equal to 30 kJ/g;

- (i) ~~or if it meets the criteria for extreme flammability in 31.3.2 for spray aerosols and or in 31.3.4 for foam aerosol~~
- (b) ~~The aerosol is classified as flammable (Division 2.1 / Category 2) if it meets the criteria for flammability in 31.3.2 for spray aerosols and or in 31.3.4 for foam aerosols; and~~
- (c) ~~The aerosol product is classified as non-flammable (Division 2.2 / Category 3) if it the product contains 1% or less flammable components and the chemical heat of combustion is less than 20 kJ/g.~~

31.3.2 In the case of spray aerosols, the classification shall ~~be made taking into account for~~ the chemical heat of combustion and ~~on the basis of the~~ results of the ignition distance test (see sub-section 31.4 of this Manual), ~~as follows:~~

- (a) ~~If the chemical heat of combustion is less than 20 kJ/g:~~
  - (i) ~~The aerosol is classified as flammable (GHS Category 2) if ignition occurs at a distance equal or greater than 15 cm but less than 75 cm;~~
  - (ii) ~~The aerosol is classified as extremely flammable (GHS Category 1) if ignition occurs at a distance of 75 cm or more;~~
  - (iii) ~~If no ignition occurs in the ignition distance test, the enclosed space test shall be performed and in this case, the aerosol is classified as flammable (GHS Category 2) if the time equivalent is less than or equal to 300 s/m<sup>3</sup> or the deflagration density is less than or equal to 300 g/m<sup>3</sup>; otherwise the aerosol is classified as non-flammable (GHS Category 3);~~
- (b) ~~If the chemical heat of combustion is equal to or more than 20 kJ/g, the aerosol is classified as extremely flammable (GHS Category 1) if ignition occurs at a distance of 75 cm or more; otherwise the aerosol is classified as flammable (GHS Category 2).~~

31.3.3 The chemical heat of combustion shall be determined following one of the methods described in the following standards: ASTM D 240, ISO/FDIS 13943:1999 (E/F) 86.1 to 86.3 and NFPA 30B.

31.3.4 In the case of foam aerosols, the classification shall be made on the basis of the results of the foam flammability test (see sub-section 31.6 of this Manual).

- (a) ~~The aerosol product shall be classified as extremely flammable (GHS Category 1) if:~~
  - (i) ~~the flame height is 20 cm or more and the flame duration is 2 s or more;~~  
~~or~~
  - (ii) ~~the flame height is 4 cm or more and the flame duration is 7 s or more;~~
- (b) ~~The aerosol product which does not meet the criteria in (a) is classified as flammable (GHS Category 2) if the flame height is 4 cm or more and the flame duration is 2 s or more.~~

31.3.5 The classification procedure ~~criteria~~ for aerosols, spray aerosols and foam aerosols, is summarized in figures 31.1, 31.2 and 31.3 respectively.

10. The experts from Canada believe that Figures 31.1, 31.2 and 31.3 are adequate and do not require GHS (only) references as the classification is explained in 31.3.

11. Lastly, it is proposed to shorten the “classification criteria” chapeau in 31.4.4.2, 31.5.4.4 and 31.6.4.2 for consistency and to avoid repetition since the criteria and hazard divisions/categories can be found in the proposed tables. The criteria for 31.6.4.2 should be completed with the information from Figure 31.3 for consistency.

31.4.4.2 ~~Spray aerosols shall be classified as flammable (GHS Category 2), extremely flammable (GHS Category 1) or non flammable (GHS Category 3) according to the following criteria:~~

<u>Criteria</u>	<u>UN Model Regulations Division</u>	<u>GHS Category</u>
<u>Ignition occurs at a distance of 75 cm or more, regardless of the heat of combustion</u>	<u>2.1</u>	<u>1</u>
<u>Ignition occurs at a distance of less than 75 cm, with a chemical heat of combustion equal to or more than 20 kJ/g</u>	<u>2.1</u>	<u>2</u>
<u>Ignition occurs at a distance equal or greater than 15 cm but less than 75 cm, with a chemical heat of combustion less than 20 kJ/g</u>	<u>2.1</u>	<u>2</u>
<u>No ignition occurs in the ignition distance test and the chemical heat of combustion is less than 20 kJ/g</u>	<u>Perform enclosed space ignition test described in section 31.5</u>	

31.5.4.4 ~~Spray An aerosols with a chemical heat of combustion less than 20 kJ/g for which no ignition occurs in the ignition distance test (see section 31.4 of this Manual) shall be is classified according to the following criteria: as flammable (GHS Category 2) if the time equivalent is less than or equal to 300 s/m<sup>3</sup> or the deflagration density is less than or equal to 300 g/m<sup>3</sup>. Otherwise the aerosol is classified as non flammable (GHS Category 3).~~

<u>Criteria</u>	<u>UN Model Regulations Division</u>	<u>GHS Category</u>
<u>Time equivalent is less than or equal to 300 s/m<sup>3</sup> or the deflagration density is less than or equal to 300 g/m<sup>3</sup></u>	<u>2.1</u>	<u>2</u>
<u>Time equivalent is more than 300 s/m<sup>3</sup> or the deflagration density is more than 300 g/m<sup>3</sup></u>	<u>2.2</u>	<u>3</u>

31.6.4.2 ~~Foam The aerosols product shall be classified according to the following criteria: as extremely flammable (Model Regulations Division 2.1 / GHS Category 1) if the flame height is 20 cm or more and the flame duration is 2 s or more; or if the flame duration is 7 s or more and the flame height is 4 cm or more.~~

<u>Criteria</u>	<u>UN Model Regulations Division</u>	<u>GHS Category</u>
<u>Flame height is 20 cm or more and the flame duration is 2 s or more</u>	<u>2.1</u>	<u>1</u>
<u>Flame height is 4 cm or more and the flame duration is 7 s or more</u>	<u>2.1</u>	<u>1</u>
<u>Flame height is 4 cm or more and the flame duration is 2 s or more</u>	<u>2.1</u>	<u>2</u>
<u>Flame height is 4 cm or less and the flame duration is 2 s or less (if any)</u>	<u>2.2</u>	<u>3</u>