



**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****Forty-sixth session**

Geneva, 1-9 December 2014

Item 8 (b) of the provisional agenda

**Issues relating to the Globally Harmonized System
of Classification and Labelling of Chemicals:
pyrophoric gases****Sub-Committee of Experts on the Globally Harmonized
System of Classification and Labelling of Chemicals****Twenty-eight session**

Geneva, 10-12 December 2014

Item 3 (h) of the provisional agenda

**Classification criteria and related hazard communication:
miscellaneous****Proposal to include pyrophoric gas as a hazard category in
the flammable gases hazard class of the GHS****Transmitted by the expert from the United States of America¹****Introduction**

1. This working paper follows several papers submitted to the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS Sub-Committee) and the Sub-Committee of Experts on the Transport of Dangerous Goods (TDG Sub-Committee) proposing that pyrophoric gases be included in the flammable gases hazard category of the GHS. The paper reflects work performed by experts from Germany, Sweden, United Kingdom, Canada, the European Industrial Gases Association (EIGA), the Compressed Gas Association (CGA), and the United States of America. See ST/SG/AC.10/C.4/2014/5 – ST/SG/AC.10/C.3/2014/54; informal document INF.4 (GHS, 27th session) – informal document INF.7 (TDG, 45th session), informal document INF.11 (GHS, 27th session) – informal document INF.40 (TDG, 45th session), and informal document INF.22 (GHS 27th session).

2. The TDG Sub-Committee had several questions and comments on the proposed amendments. This paper addresses these questions and comments on the proposed hazard category.

¹ In accordance with the programme of work of the Sub-Committee for 2013–2014 approved by the Committee at its sixth session (see ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

Responses to questions posed by the TDG Sub-Committee

3. The TDG Sub-Committee asked about the rationale for creating a separate hazard category within the flammable gases hazard class instead of a separate hazard class for pyrophoric gases, and the rationale for creating an additional separate hazard category for pyrophoric gases instead of a sub-category under Category 1 flammable gases, taking into account that the proposed hazard communication elements only differ in the hazard statement. The small group of experts evaluated this in detail, and concluded the following:

- (a) A separate hazard class is not appropriate because gases that have a flammable range at 55 °C also have a flammable range at 20 °C. In addition, there are no known examples of gases with a flammable range at 54 °C, but not at 20 °C. The group expressed concerns of overlooking the appropriate classification of gas mixtures as flammable if the classification of the gases as pyrophoric is in a “stand-alone” class and not in an additional sub-category.
- (b) The experts agreed that all known pyrophoric gases would be classified as Category 1 flammable gases. In addition, all flammable mixtures containing pyrophoric gases that industry puts on the market are Category 1 as well. However, the group of experts cannot prove that a Category 2 flammable gas mixture containing more than 1% pyrophoric components is not possible.

After evaluating these issues, the group determined that pyrophoric gases are best captured as a sub-category within the flammable gas hazard class.

4. The TDG Sub-Committee asked about the correlation between the ignition temperature to determine pyrophoricity in DIN Standard 51794 (in paragraph 2.2.4.4.2) and the temperature set out in the definition of pyrophoric gases (in paragraph 2.2.1.2). The small group of experts discussed this issue as well.

5. They evaluated how the scope of DIN 51794 (which refers to temperatures of 75 °C to 650 °C) and the chosen criterion of 54 °C can work together. The text of the DIN 51794 test method explains that the method can be carried out at any temperature from room temperature on up. Adding the text “at 54 °C” clarifies that the test method can be applied in the context of the classification criteria and that the test should be carried at the specific temperature of 54 °C when testing a gas for pyrophoricity. Therefore, the temperature of 54 °C has been added to the guidance in proposed paragraph 2.2.4.4.2 to ensure that this temperature is used during tests conducted for classifying these gases.

6. The TDG Sub-Committee asked about the rationale for 54°C in the definition for pyrophoric gases. During the TDG Sub-Committee meeting, the expert from the United States of America correctly explained that this temperature could be reached under normal conditions of transport; therefore, this value was kept to ensure that gases able to show a pyrophoric behaviour during transport at this temperature were adequately classified as such. In addition, pyrophoric gases have been identified using this temperature in the United States of America for a number of years.

Proposed amendments to the GHS

7. At its 27th session, the GHS Sub-Committee adopted the amendments contained in the proposal by the United States of America (document ST/SG/AC.10/C.4/2014/5 – ST/SG/AC.10/C.3/2014/54) as amended by INF.11 (GHS, 27th session) – INF.40 (TDG, 45th session)². The full list of amendments provisionally adopted by the GHS Sub-Committee at its 25th, 26th and 27th sessions has been circulated in document ST/SG/AC.10/C.4/2014/13.

² See report of the GHS Sub-Committee on its 27th session, document ST/SG/AC.10/C.4/54, paragraph 43.