

**UN/SCEGHS/13/INF.5**  
**UN/SCETDG/31/INF.22**

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**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

Thirty-first session  
Geneva, 2-6 July 2007  
Item 10 (a) of the provisional agenda

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

Thirteenth session  
Geneva, 9-11 July 2007  
Item 2 (a) of the provisional agenda

**UPDATING OF THE GLOBALLY HARMONIZED SYSTEM OF  
CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)**

Physical hazards

Report of the 1<sup>st</sup> meeting of the working group on chemically unstable gases

Transmitted by the expert from Germany on behalf of the working group

**Introduction**

1. During its last meeting the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals agreed on terms of references for an informal working group that shall address the classification of chemically unstable gases.

2. The experts from Germany prepared a draft proposal for a test method allowing the classification of chemically unstable gases and sent it to the heads of the delegations of the Sub-Committees TDG and GHS. The first meeting of the informal working group took place on May 3 and 4, 2007. Experts from the United States of America and Germany and representatives of EIGA and CGA attended the meeting. The draft proposal for a test method was used as a basis for the work of the informal working group.

**Report of the meeting**

3. The first draft of a proposed test method for the classification of chemically unstable gases is based on a test method which is described in ISO 10156:1996 and ISO 10156-2:2005. These standards are already referred to in the GHS (2005) in section 2.2.5 on flammable gases and section 2.4.4.1 on oxidizing gases, respectively. The test method is based on igniting the test gas or gas mixture in an ignition vessel using an exploding wire. Chemical instability is detected by a pressure rise of at least 10 % at the respective test conditions. The proposed test conditions are:

- Ambient conditions (ignition energy 5 J)
- Elevated conditions (65 °C and the pressure used for transport) (ignition energy 15 J) (only if no positive result is obtained in the previous test)
- Test of the liquefied substance (ignition energy 40 J) (only if applicable).

4. The working group discussed some details of the proposed test method such as the ignition source, the pressure rise criterion or the test of the liquid phase.

5. The test of the liquid phase was introduced in the proposal to cover gases or gas mixtures which are stored or handled in the liquid phase and which in the previous tests of the gaseous phase had negative test results. The necessity and feasibility of this test was discussed. Since this test is not of high priority, it was agreed to postpone the discussion and that for the time being the details of this test are not pursued.

6. During the discussion of the proposed test method it became clear that some more fundamental questions would have to be clarified first.

7. Some of the participants raised some more general doubts whether more information as a consequence of classification of chemically unstable gases is helping to prevent accidents or incidents. However, it was agreed that this question is not the issue of this working group. The aim should be correct classification allowing for appropriate hazard communication. Whether this information is adequately used (e.g. by employers for risk assessment purposes) is beyond the scope of this working group.

8. There were also long discussions about possible ways how to achieve hazard communication for chemically unstable gases and how this might be integrated into the GHS. However, it was agreed that first a test method for the classification of chemically unstable gases should be worked out and that the issue of incorporation into the GHS and hazard communication shall be postponed to a later meeting.

9. The participants from CGA shortly introduced their standard system according to NFPA 704 that allows for a multistage classification of solids and liquids. According to this system, instability hazards are divided into degrees of hazard from 4 to 0 based on their power density in W/mL. However, this standard does not present a test method for determining the power density. Instead, it refers to other (ASTM) standards. The question whether these standards and the respective test methods are applicable to gases could not be clarified during the meeting.

10. It was agreed that a first step of a new classification procedure shall be based on testing at ambient conditions. Ambient conditions in this context still would have to be defined and might be a slightly elevated pressure such as 1.2 bar abs. The reason is that acetylene – if used as benchmark – shall definitely lead to a positive test result at ambient conditions.

11. The second (and further) steps of the classification procedure are still to be agreed:

- It was pointed out that the results of the tests at ambient conditions could be used for the further multistage classification by determining the energy output. However, the feasibility of this approach still has to be clarified.
- Another approach is to carry out tests at elevated conditions as indicated in the

proposed test method and to use these results to distinguish between gases which are chemically unstable at ambient conditions and at elevated conditions.

12. The expert from the United States of America mentioned that transport regulations should not be affected by a future classification of chemically unstable gases. It was agreed that pure chemically unstable gases are adequately dealt with for transport by linking the respective packing instructions to the respective entries in the Dangerous Goods List. The question how mixtures of gases that contain a chemically unstable gas could be covered remains to be discussed.

### **Comments received in advance**

13. Comments were sent in advance by representatives of EIGA and the chemical industry.

14. EIGA had no fundamental remark on the proposed test method itself but would like to supplement it with a table listing the maximum concentrations of chemically unstable gases in mixtures which can be considered as being not chemically unstable themselves. The participants welcomed this as a tool which can reduce the amount of testing. However, since the participants agreed that first a test method should be worked out before considering the possibility of having specific concentration limits, the working group did not discuss the proposed entries and postponed this issue to a later meeting.

15. The representative of the chemical industry had some comments regarding the specifics of the proposed test method. These comments were not dealt with during the meeting because – as a consequence of the CGA proposal to also consider a procedure similar to that outlined in NFPA 704 – it is not clear whether this test method will be used or not. These comments will be kept until the details of the test method will be worked out.

### **Further proceeding**

16. The US delegates agreed to look for the standards that are referred to in the NFPA 704 as reference for applicable test methods to determine the energy output of decomposition reactions. Furthermore they will try to find out whether these methods are applied to gases as well and whether any corresponding test results are available.

17. After receiving information regarding test methods for determining the energy output of reactions in the gaseous phase, the experts from Germany will consider an approach similar to that proposed in NFPA 704.

### **Date and place of the next meeting**

18. EIGA offered to host the next meeting. A date for the meeting is not yet fixed.

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