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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****Forty-fifth session**

Geneva, 23 June – 2 July 2014

Item 11 (d) of the provisional agenda

**Issues relating to the Globally Harmonized System of  
Classification and Labelling of Chemicals: Tests and  
criteria for oxidizing solids****Sub-Committee of Experts on the Globally Harmonized  
System of Classification and Labelling of Chemicals****Twenty-seventh session**

Geneva, 2 – 4 July 2014

Item 3 (a) (i) of the provisional agenda

**Classification criteria and related hazard  
communication: work of the Sub-Committee of Experts  
on the Transport of Dangerous Goods (TDG): physical  
hazards****Use of cellulose in UN Test 0.2 (Test for oxidizing liquids) and  
UN Test 0.3 (Test for oxidizing solids)****Submitted by the expert from France<sup>1</sup>****Introduction**

1. Test O.2 (test for oxidizing liquids) of the Manual of Tests and Criteria determines the oxidizing properties of liquid substances. The GHS refers to this test method as well for the purposes of classification of oxidizing liquids.
2. This test method is designed to measure the potential for a liquid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed or to form a mixture which spontaneously ignites. The liquid is mixed in a 1 to 1 ratio, by mass, with fibrous cellulose, the mixture heated in a pressure vessel and the rate of pressure rise determined.
3. The mean pressure rise time of a 1:1 mixture, by mass of substance and cellulose is compared with that of the same mass ratios of reference substances (50% perchloric acid, 40% aqueous sodium chlorate solution and 65% aqueous nitric acid) and cellulose.

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

The packing group for transport or the hazard category according to the GHS, respectively, are assigned based on the results of the mean time taken for the pressure to rise from 690 kPa to 2070 kPa gauge in comparison to the reference mixtures.

## **New difficulties associated with test O.2**

4. The fibrous cellulose, with a fibre length between 50 and 250 µm and a mean diameter of 25 µm, used as the combustible material, as specified by the national contact from Sweden, is no longer produced. This cellulose was validated by several inter-laboratory trials in the 1990s.

5. In France, tests have been carried out with two new cellulose candidates. The mean pressure rise times of tests made with the reference oxidizing liquids and the new celluloses were compared with the mean values indicated in the Manual of Tests and Criteria. Tests were carried out on other known oxidizing liquids as well. The first results are not conclusive. The new celluloses used as replacement do not reproduce the same classification in the packing groups of known oxidizing liquids, in accordance with their attributed UN numbers.

## **Difficulties are also associated with test O.3**

6. Furthermore it should be underlined that the dried fibrous cellulose as described in UN test O.3 adopted by the Committee in December 2012 ( see ST/SG/AC.10/40/Add 2 ) for inclusion in the Manual of Tests and Criteria is the same one as in UN test O.2, the base cellulose is therefore no longer available for this test too. Some improvement to UN test O.3 should be necessary. This is also true with regards to UN test O.1 if this test is to be maintained in the Manual.

## **Proposal 1**

7. Further research is needed to define the appropriate replacement cellulose to be used as the combustible substance in the UN test O.2 for oxidizing liquids.

8. The expert from France proposes to organize a round robin testing programme with recognized public and industrial laboratories to achieve a consensus.

## **Proposal 2**

9. The expert from France proposes to include in the programme of work for 2015-2016 the following item: Classification and testing of oxidizing liquids and solids.

10. If this second proposal is adopted, the expert from France is in a position to conduct the necessary testing programme with interested parties for both oxidizing liquids and solids.

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