



**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****Fifty-second session**

Geneva, 27 November-6 December 2017

Item 2 (e) of the provisional agenda

Explosives and related matters:**stability tests for industrial nitrocellulose****Stability tests for nitrocellulose****Transmitted by the expert from Germany*****Introduction**

1. The stabilization of nitrated cellulose (NC) mixture is a decisive and critical step in the production process of NC and must be done and controlled properly for each production lot in order to achieve stable NC products that can be transported and used safely without the danger of self-ignition over their entire shelf life. The wetting of NC mixtures with alcohol, water or plasticizer only reduces the burning speed of the NC; it has no effect on the stability of the NC mixtures. Additional measures are necessary to ensure the stability even if the NC mixture will get completely dry.

2. At the fifty-first session in July, the Working Group on Explosives of the Sub-Committee of Experts on the Transport of Dangerous Goods confirmed the statements of the German proposal ST/SG/AC.10/C.3/2017/3 that additional tests were necessary to confirm that different NC mixtures are stable even if, for instance, the mixtures get completely dry. The Working Group on Explosives determined that the 3(c) thermal stability test at 75 °C currently available in the Manual of Tests and Criteria was not suited for evaluating the stabilization of nitrocellulose and its mixtures. The Working Group on Explosives unanimously concluded that the Bergmann Junk test and the Methyl Violet Paper tests were suitable tests for assessing the thermal stability of NC/NC mixtures.

* In accordance with the programme of work of the Sub-Committee for 2017-2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, paragraph 14)

3. The Working Group on Explosives agreed that CEFIC should lead an intersessional informal group that is to make proposals for the description of the test procedures (Bergmann Junk test and Methyl Violet Paper test) and draw up proposals for incorporating these into the United Nations Model Regulations and Manual of Tests and Criteria. In addition, this group is to examine whether transitional provisions for existing NC stability tests are appropriate and/or needed. The results of the group are to be presented in a document for the fifty-second session of the Sub-Committee (agenda Item 2(e), paragraph 8 of the report of the Working Group on Explosives (informal document INF.38 (fifty-first session)).
4. The Sub-Committee confirmed the decisions of the Working Group on Explosives, (paragraphs 25 and 26 of the report of the Sub-committee on its fifty-first session, ST/SG/AC.10/C.3/102).
5. This approach is explicitly endorsed and a general description of the necessary amendments is given in the following. The detailed wording of the amendments should be done on the basis of the results of the intersessional group.

Proposals

6. NC and its mixtures of Class 1 (UN 0340, UN 0341, UN 0342 and UN 0343) and Division 4.1 (UN 2555, UN 2556, UN 2557 and UN 3380) should only be transported if they are chemically and thermally stable to a sufficient degree. This requirement for transport is to be incorporated into chapters 2.1 and 2.4 of the Model Regulations.
7. The chemical and thermal stability of NC and its mixtures are to be tested by means of the following tests:
 - (a) Bergmann Junk test: measurement of the amount of nitrogen oxides released over a period of two hours at 132 °C, where the amount of nitrogen oxides released shall not exceed 2.5 ml of NO/ g NC; or
 - (b) Methyl Violet Paper test: measurement of the amount of nitrogen oxides released at 134.5 °C over a period of at least 30 minutes, where the methyl violet paper shall not have completely changed its colour.NC and its mixtures that comply with the criteria of the Bergmann Junk test or of the Methyl Violet Paper test shall be classified as chemically and thermally stable to a sufficient degree.
8. The Bergmann Junk test and the Methyl Violet Paper test should be included in the Manual of Tests and Criteria as test methods to be used, if appropriate in a new Annex 8.
9. Depending on the result of the intersessional informal group, transitional provisions are to be included in the Model Regulations.