



**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****Fiftieth session**

Geneva, 28 November-6 December 2016

Item 2 (b) of the provisional agenda

**Recommendations made by the Sub-Committee
on its forty-seventh, forty-eighth and
forty-ninth sessions and pending issues:
explosives and related matters****Manual of Tests and Criteria****Proposals to amend section 10.3.3****Transmitted by the expert from Sweden and the Australian Explosives
Industry and Safety Group Inc. (AEISG)¹****Introduction**

1. After reviewing section 10.3.3 in the Manual of Tests and Criteria (ST/SG/AC.10/11/Rev. 6) regarding the application of test methods, particularly test series 3 and 4, the expert from Sweden and AEISG have identified some deficiencies in 10.3.3.2 and 10.3.3.4, which need to be revised to make the information correct in fact, more easily understood and less prone to misinterpretation.
2. Test Series 3 is designed to determine whether a new substance is too thermally unstable or too sensitive to be included in Class 1. The substance should pass all test types in Test Series 3 in order to be provisionally accepted into Class 1.

¹ In accordance with the programme of work of the Sub-Committee for 2015–2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.3/92, paragraph 95 and ST/SG/AC.10/42, para. 15).

3. Section 10.3.3.2 provides guidance about the application of Test Series 3. It contains a description of the purpose of Test Series 3, the decision procedure based on the test results and what can be done if the substance fails the tests.

4. Test Series 4 is designed to determine whether a new article, packaged or unpackaged, is too thermally unstable or too sensitive to be included in Class 1. Test Series 4 is also used to determine if a substance that is too dangerous for transport according to Test Series 3 still can still be included in Class 1, when it is packaged or encapsulated.

Necessity of revision

5. As illustrated in Figure 10.2, the design principle of Test Series 4 implies that all new articles, either packaged or unpackaged, shall be subjected to Test Series 4 i.e. test type 4 (a) and test type 4 (b), regardless of whether the substances contained in the articles have passed Test Series 3. Furthermore, substances that are thermally stable but are too dangerous for transport according to Test Series 3 are subjected to test type 4 (b), when they have been packaged or encapsulated. Test type 4 (a) is not necessary in the latter case, since the substances have already been demonstrated thermally stable by Test Series 3.

6. However, the wording in 10.3.3.4 is not consistent with the above-stated principle. The following two incorrect conclusions may be readily derived from a reading of 10.3.3.4:

- Packaged articles containing substances which have passed Test Series 3 should not be subjected to Test Series 4; and
- All packaged substances, including those containing substances which have passed Test Series 3, shall be subjected to test type 4 (b).

7. The major part of 10.3.3.2 describes the application of Test Series 3 on substances. However, in the middle of 10.3.3.2, there is a sentence describing the application of Test Series 4 on articles, which is repeated later in 10.3.3.4. To make the text more logical and easily understood, it is considered necessary to re-word 10.3.3.2 so that it only deals with Test Series 3, while 10.3.3.4 deals with Test Series 4.

8. Section 10.3.3.3 contains additional explanations and advices about how classification tests may be carried out more rationally and efficiently. It deals not only with Test Series 3 or Test Series 4. For reasons of logical structure and readability, it is considered a better solution to place 10.3.3.3 after 10.3.3.4 i.e. to reverse the order of 10.3.3.3 and 10.3.3.4. After these proposed changes, the new section 10.3.3.2 would deal only with substances, 10.3.3.3 with articles, packaged articles and packaged substances and 10.3.3.4 with additional information.

Proposal 1

9. To re-word 10.3.3.2 so that it only describes the application of Test Series 3 on substances.

Proposal 2

10. To revise 10.3.3.4 so that the description is consistent with the design principle of Test Series 4 as illustrated in Figure 10.2.

Proposal 3

11. To reverse the order of 10.3.3.3 and 10.3.3.4 so that the sections are arranged in the following logical order; 10.3.3.2 on Test Series 3, 10.3.3.3 on Test Series 4 and 10.3.3.4 on additional information for classification tests.

The proposed new sections 10.3.3.2, 10.3.3.3 and 10.3.3.4

12. The final text after the proposed amendments is shown below:

“10.3.3.2 The acceptance procedure for substances designed to have an explosive effect starts with the application of test types 3 (a), 3 (b), 3 (c) and 3 (d) to determine if the substance is too sensitive for transport in the form in which it is tested. If it proves to be thermally unstable, i.e. it fails test type 3 (c), it is not permitted to be transported. If it fails test types 3 (a), 3 (b) or 3 (d) it may either be encapsulated or otherwise desensitized or packaged to reduce its sensitiveness to external stimuli. Examples are water-wetted primary explosives and primary explosives which have been encapsulated in the form of detonators. ~~The resulting new articles should be submitted to test series 4, and liquids or packaged solids to a test of type 4 (b), to determine whether or not their level of safety in transport is consistent with the requirements of Class 1.~~ Desensitized substances should be re-examined under test series 3 to determine whether their level of safety in transport is consistent with the requirements of Class 1. ~~for the same purpose.~~ If a substance designed to have an explosive effect passes all tests in Test series 3 ~~or an article designed to have an explosive effect passes all tests in series 4~~, the procedure for assignment to the appropriate division is applied.”

~~10.3.3.3 Although test series 1 indicates whether a substance, not designed to have an explosive effect, has in fact potentially explosive properties, again it is more appropriate to start the testing procedure with test series 3. These tests involve relatively small sample sizes, which reduces the risk to test personnel. If test series 3 indicates that a substance is too sensitive for transport in the form in which it is tested, then the procedures for reducing its sensitiveness to external stimuli, outlined in 10.3.3.2, should be applied. If test series 3 indicates that the substance is not too sensitive for transport, the next step is the application of test series 2 which determines whether the substance is too insensitive for inclusion in Class 1. There is no real need to perform test series 1 at this point in the acceptance procedure since test series 2 answers the pertinent question regarding the degree of insensitiveness of the substance. Test series 1 is concerned with the resolution of questions relating to the explosive nature of the substance. The procedure for assignment to a division of Class 1 should be applied to substances which fail test series 2 but pass test series 3 i.e. they are not too insensitive for acceptance into Class 1 nor are they thermally unstable or too dangerous to transport in the form in which they are tested. It is important to note that a substance which fails test series 2 may still, if properly packaged, leave Class 1 provided that the product is not designed to have an explosive effect and does not exhibit any explosive hazard in test series 6 of the assignment procedure.~~

“10.3.3.3 All articles or packaged articles ~~containing substances which have failed test type 3 (a), 3 (b) or 3 (d)~~ should be subjected to test series 4. If the article or packaged articles pass test type 4 (a), test type 4 (b) is performed. Encapsulated and/or packaged substances containing substances which have failed test types 3 (a), 3 (b) or 3 (d) are subjected to test type 4 (b) only. If the product fails either test type 4 (a) or 4 (b), it should be rejected. However, the product may be modified and re-

tested. If the product passes all the required tests in Test Series 4, the procedure for assignment to the appropriate division is applied. If the competent authority suspects that the product may be subject to stimuli other than those specified in test type 4 (a) and 4 (b) resulting in potentially dangerous effects, additional information or tests may be required (see note under paragraph 2.1.3.3.1 of the Model Regulations).”

“10.3.3.3 Although test series 1 indicates whether a substance, not designed to have an explosive effect, has in fact potentially explosive properties, again it is more appropriate to start the testing procedure with test series 3. These tests involve relatively small sample sizes, which reduces the risk to test personnel. If test series 3 indicates that a substance is too sensitive for transport in the form in which it is tested, then the procedures for reducing its sensitiveness to external stimuli, outlined in 10.3.3.2, should be applied. If test series 3 indicates that the substance is not too sensitive for transport, the next step is the application of test series 2 which determines whether the substance is too insensitive for inclusion in Class 1. There is no real need to perform test series 1 at this point in the acceptance procedure, since test series 2 answers the pertinent question regarding the degree of insensitiveness of the substance. Test series 1 is concerned with the resolution of questions relating to the explosive nature of the substance. The procedure for assignment to a division of Class 1 should be applied to substances which fail test series 2 but pass test series 3 i.e. they are not too insensitive for acceptance into Class 1 nor are they thermally unstable or too dangerous to transport in the form in which they are tested. It is important to note that a substance which fails test series 2 may still, if properly packaged, leave Class 1 provided that the product is not designed to have an explosive effect and does not exhibit any explosive hazard in test series 6 of the assignment procedure.”
