

**Committee of Experts on the Transport of Dangerous Goods
and on the Globally Harmonized System of Classification
and Labelling of Chemicals**

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**Sub-Committee of Experts on the
Transport of Dangerous Goods**

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Item 10 (c) of the provisional agenda

**Issues related to the Globally Harmonized System:
Miscellaneous**

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

Forty-third session

Geneva, 7-9 December 2022

Item 3 (i) of the provisional agenda

**Work on the Globally Harmonized System of
Classification and Labelling of Chemicals: other
matters**

**Comments on document ST/SG/AC.10/C.3/2022/50
–ST/SG/AC.10/C.4/2022/10 : Amendments to the
classification of desensitized explosives according to the GHS**

**Transmitted by the Australasian Explosives Industry Safety Group
(AEISG)**

Introduction

1. AEISG supports in principle the proposal in ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10. However, AEISG believes that the proposal as presented:

- (a) will result in an obligation for additional, unjustified testing, which can be avoided by incorporating some minor amendments; and
- (b) does not consider the obligations in the current text in the Model Regulations and in the Manual of Tests and Criteria which should be amended in consequence of the changes proposed by the United States of America and Germany.

2. AEISG presents below some suggestions for minor improvements and further consequential amendments to the Model Regulations and the Manual of Tests and Criteria for consideration by the sub-committees.

Discussion

Issue 1: Duplication of burning rate tests

3. As presented, the proposal in document ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10 is a practical way to classify desensitized explosives according to GHS, however it does not include the flexibility to allow the burning rate test in Section 51 of the Manual of Tests and Criteria to be used in lieu of test 6 (c). Thus, as currently drafted, to classify a material as desensitized explosive for transport purposes, it will still be necessary to do the bonfire test (Test 6 (c)).

4. The exclusion of reference to test 6 (c) in the proposal in document ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10 (at 2.17.2.2 (b)(i) and in decision logic 2.17.1) implies that the burning rate test in Section 51 should be allowed in lieu of test 6 (c).

5. Working through the Model Regulations section 2.1.3.6 (Exclusion from Class 1), the route to desensitized explosives is in 2.1.3.6.3. However, 2.1.3.6.3 requires that the diluted material be subject to Test Series 6. This includes test 6 (c).

6. The wording in 10.3.3.4 of the Manual of Tests and Criteria has the same failing: there is no allowance in either paragraph to allow a phlegmatized or diluted explosive product to escape from class 1 for transport purposes using the desensitized explosive tests in Section 51 of the Manual.

Proposal

7. The following amendments to the Model Regulations and the Manual of Tests and Criteria are proposed as additional consequential amendments to the proposals in ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10, to address issue 1.

Amendments to the Model Regulations

8. Amend paragraphs 2.1.3.6.2 and 2.1.3.6.3 as follows (*new text in bold underlined, deleted text struck through*):

“2.1.3.6.2 Where a substance provisionally accepted into Class 1 is excluded from Class 1 by performing test series 6 **or the tests in Section 51 of the Manual of Tests and Criteria** on a specific type and size of package, this substance, when meeting the classification criteria or definition for another class or division, should be listed in the Dangerous Goods List of Chapter 3.2 in that class or division with a special provision restricting it to the type and size of package tested.

2.1.3.6.3 Where a substance is assigned to Class 1 but is diluted to be excluded from Class 1 by test series 6 **or Section 51 of the Manual of Tests and Criteria**, this diluted substance (hereafter referred to as desensitised explosive) shall be listed in the Dangerous Goods List of Chapter 3.2 with an indication of the highest concentration which excluded it from Class 1 (see 2.3.1.4 and 2.4.2.4.1) and if applicable, the concentration below which it is no longer deemed subject to these Regulations. New solid desensitised explosives subject to these Regulations shall be listed in Division 4.1 and new liquid desensitised explosives shall be listed in Class 3. When the desensitised explosive meets the criteria or definition for another class or division, the corresponding subsidiary hazard(s) shall be assigned to it.”

9. It is considered that no consequential change is needed for 2.4.2.4 of the Model Regulations as 2.4.2.4.1 covers desensitised explosives and references 2.1.3.6.3 which would already be amended as indicated above.

Amendments to the Manual of Tests and Criteria

10. Amend section 10, paragraph 10.3.3.4 of the Manual as follows (*new text in bold underlined, deleted text struck through*):

“10.3.3.4 Test series 1 indicates whether a substance has explosive properties. However, for a new substance not designed to have a practical explosive or pyrotechnic effect, it is more appropriate to start the testing procedure with test series 3. Test Series 3 involves relatively small sample sizes, which reduces the risk to test personnel. If the substance passes test series 3, as a practical matter the next step is the application of test series 2 which determine whether the substance is too insensitive for inclusion into the class of explosives. There is no real need to perform test series 1 at this point. Substances which fail test series 2 but pass test series 3 shall be subjected to the procedure for assignment to the appropriate division of explosives. It is important to note, however, that a substance which fails test series 2 may still be excluded from the class of explosives provided the substance is not designed to have a practical explosive or pyrotechnic effect **in that state and either**~~nor~~ exhibits ~~any~~**no** hazardous effects in test series 6 of the assignment procedure as packaged (**refer Figure 10.3), or satisfies the criteria for inclusion as a desensitised explosive in accordance with Section 51 of the Manual of Tests and Criteria.**

11. Amend sub-section 32.3.2 of the Manual as follows (*new text in bold underlined, deleted text struck through*):

“32.3.2 Liquid desensitized explosives

32.3.2.1 This sub-section presents the Model Regulations scheme for the classification of liquid desensitized explosives as flammable liquids (see paragraph 2.3.1.4 of the Model Regulations ~~and note 2 to paragraph 2.1.1 of the GHS~~). Liquid desensitized explosives are substances which are dissolved or suspended in water or other liquid substances to form a homogeneous liquid mixture in order to suppress their explosives properties.

32.3.2.2 Where a substance meets the criteria for classification as explosive but is diluted to be exempted from this class by test series 6 **or section 51** (~~see section 16~~), this diluted substance, when meeting the classification criteria or definition for another hazard class, should be classified in that class at the highest concentration which exempts it from the class of explosives. When sufficiently diluted, such substances may be deemed to be non-dangerous for some regulatory purposes (e.g. transport) (see also paragraph 2.1.3.6.3 of the Model Regulations).

32.3.2.2.1 The classification scheme of liquid desensitized explosives ~~for supply and use (including storage) according to the GHS~~ is given in section 51.”

12. Amend sub-section 33.3 of the Manual as follows (*new text in bold underlined, deleted text struck through*):

“33.3 Solid desensitized explosives

33.3.1 This sub-section presents the Model Regulations scheme for the classification of desensitized explosives as flammable solids of Division 4.1 (see sub-section 2.4.2.4 of the Model Regulations ~~and note 2 to paragraph 2.1.2.2 of the GHS~~). Solid desensitized explosives are substances which are wetted with water or alcohols or are diluted with other substances to form a homogeneous solid mixture in order to suppress their explosive properties.

33.3.2 Where a substance meets the criteria for classification in the class of explosives but is diluted to be exempted from this class by test series 6 **or section 51** (~~see section 16~~), this diluted substance, when meeting the classification criteria or definition for another hazard class, should be classified in that class at the highest concentration which exempts it from the class of explosives. When sufficiently diluted, such substances may be deemed to be non-dangerous for some regulatory purposes (e.g. transport) (see also paragraph 2.1.3.6.3 of the Model Regulations).

33.3.3 The classification scheme of solid desensitized explosives ~~for supply and use (including storage) according to GHS~~ is given in section 51.”

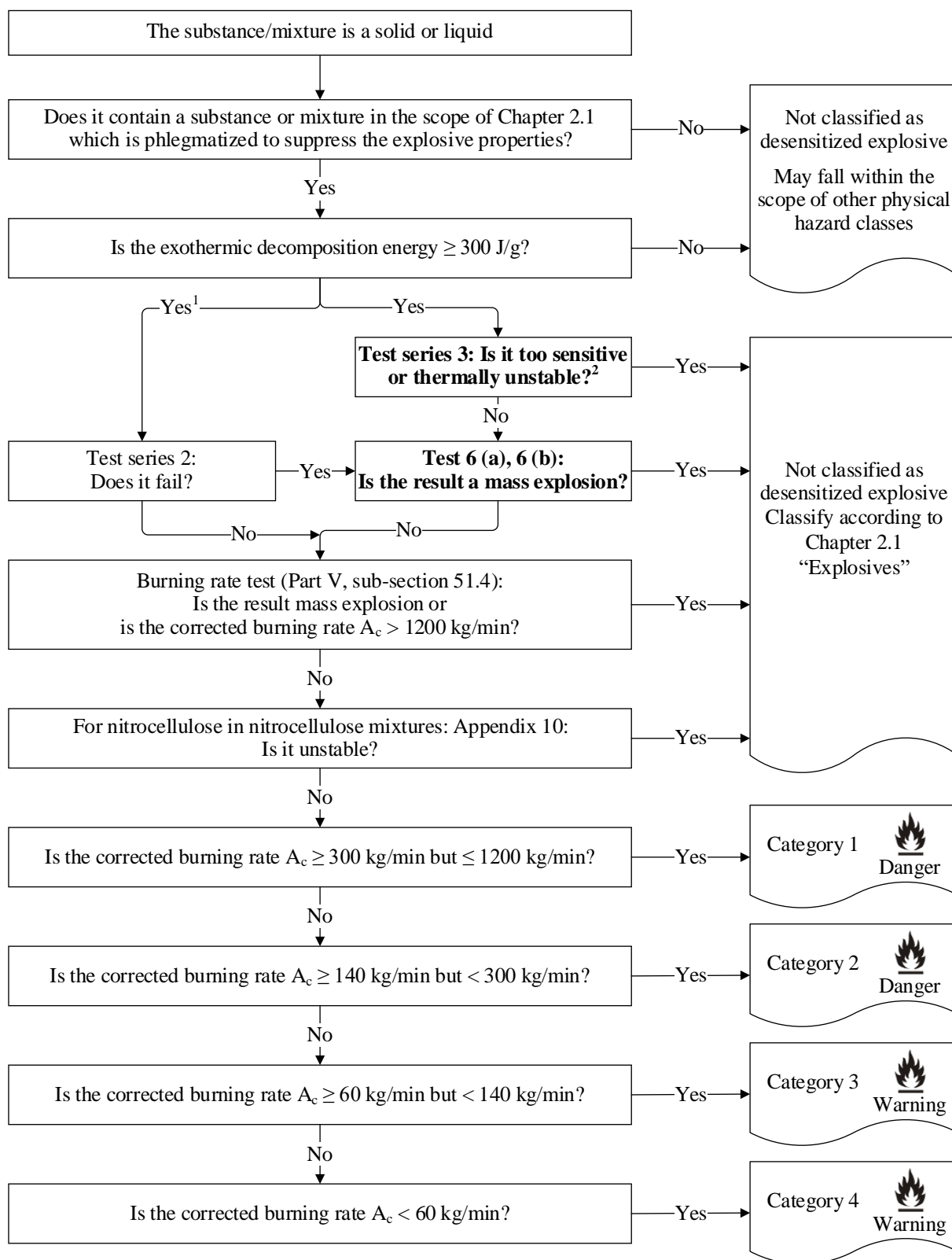
Issue 2: Order of testing

13. This is a minor drafting issue with no technical consequences.

14. It is suggested that, to be consistent with the principles in 10.3.3.4 of the Manual, the tests series 3 and tests 6 (a) and 6 (b) referenced in the decision logic proposed in document ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10 be reversed in order so that test series 3 is conducted prior to Test 6 (a) and (b). This follows the principle of first determining how sensitive a material is before doing larger tests on it.

Proposal

15. In decision logic 2.17.1 in document ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10, reverse the order of the boxes referring to test series 3 and test series 6 (a) and (b) as indicated (*reversed boxes are shown in bold*):



Issue 3: Exemption of Test Series 3

16. This is a substantive safety issue.

17. There appears to be no justification for exempting nitrocellulose mixtures from all of Test Series 3. A mixture of nitrocellulose with, for example, chlorate and grit, such as used in some pyrotechnic mixes could be sensitive to friction and hence should be subject to an assessment of its impact or friction sensitivity. The exemption from Test 3 (c) for nitrocellulose mixtures is supported.

Proposal

Amend the proposal in ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10 as follows (*new text in bold underlined, deleted text struck through*):

2.17.2.3 Delete the note under the paragraph as follows:

“2.17.2.3 In addition to the criteria in 2.17.2.1 and 2.17.2.2, nitrocellulose should be stable according to Appendix 10 of the *Manual of Tests and Criteria* in order to be used in nitrocellulose mixtures considered for this class.

~~**NOTE:** Nitrocellulose mixtures containing no other explosives than nitrocellulose, do not need to meet the criterion of 2.17.2.2 (b) (ii).”~~

Decision logic 2.17.1 In footnote 2, replace “Test series 3” with “Test 3 (c)” as follows:

“² ~~Test series 3~~ **3(c)** is not applicable to nitrocellulose mixtures containing no other explosives than nitrocellulose.”

Section 51, sub-paragraph 51.3.2 (c) Replace “Test series 3” with “Test 3 (c)” as follows:

“(c) ~~Test series 3~~ **3(c)** is not applicable to nitrocellulose mixtures containing no other explosives, for which stability of the nitrocellulose is established according to Appendix 10.”

Issue 4: Clarification of 51.2.2 in ST/SG/AC.10/C.3/2022/50 – ST/SG/AC.10/C.4/2022/10

18. This is a drafting issue to remove some potentially unintended consequences for nitrocellulose caused by the proposed wording.

19. The introductory sentence in 51.2.2, refers to testing of desensitized explosives and is followed by sub-paragraphs (a) to (c) describing the applicable tests. But then the last sub-paragraph refers to testing of nitrocellulose, which, when read in conjunction with the introductory sentences results in the following: “*Desensitized explosives should be tested for their exothermic decomposition... according to test 1 (a), according to the corrected burning test; and nitrocellulose should be tested in accordance to Appendix 10...*”.

20. The text in (d) refers to nitrocellulose specifically and does not read well in conjunction with the preceding text that refers to testing of desensitized explosives in general.

Proposal

21. Amend the proposal in ST/SG/AC.10/C.3/2022/50 –ST/SG/AC.10/C.4/2022/10 for paragraph 51.2.2 as follows (*only the additional proposed changes are shown below. New text in bold underlined*):

“51.2.2 Desensitized explosives should be tested:

(a) for their exothermic decomposition energy¹, if attempting to exit the class of desensitized explosives;

- (b) according to test 1 (a), test series 2 and 3 and tests 6 (a) and (b), respectively of this Manual and according to the classification procedure in section 51.3, to preclude a mass explosion in the corrected burning rate test ; **and**
- (c) according to the corrected burning rate test.

51.2.3 Nitrocellulose should be tested according to Appendix 10 of this Manual in order to be used in nitrocellulose mixtures.”

(The text of the related footnote 1 remains unchanged)
