



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

Sixty-first session

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Item 10 (c) of the provisional agenda

**Issues relating 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**

Amendments to the classification of desensitized explosives according to the GHS

Transmitted by the experts from Germany and the United States of
America*

Background

1. During the last sessions several documents on amendments to the classification of desensitized explosives were discussed. The proposals submitted to the Sub-Committee of Experts on the transport of dangerous Goods (TDG Sub-Committee) and the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS Sub-Committee) at its sixtieth and forty-second sessions respectively, were supported in principle with two amendments and one correction proposed by the working group on explosives. Reference is made to:

- (a) report of the working on explosives, (informal document INF.44 (sixtieth session), paragraph 18);
- (b) report of the TDG Sub-Committee on its sixtieth session, (document ST/SG/AC.10/C.3/120, paragraph 100);
- (c) report of the GHS Sub-Committee on its forty-second session, (document ST/SG/AC.10/C.4/84, paragraphs 37 and 38).

2. Detailed explanations and justifications were given in previous documents. In that context the authors would like to refer especially to working document ST/SG/AC.10/C.3/2021/37–ST/SG/AC.10/C.4/2021/7 (paragraphs 9 to 20) of the December 2021 session and to informal document INF.28 (TDG, sixtieth session)

* A/75/6 (Sect.20), para. 20.51

(paragraphs 6 to 17 in the annex of the document) and to the same explanations in informal document INF.8 (forty-second session) (paragraphs 6 to 17) of the June/July 2022 session.

Proposal

3. The proposals as discussed, amended and supported in principle in the last sessions of the TDG and GHS sub-committees are listed in the annex to this document. The full text of Chapter 2.17 of the GHS and section 51 of the Manual of Tests and Criteria as amended by the proposal in this document is reproduced in a clean version in informal document INF.4 (TDG) – INF.5 (GHS)

4. The sub-committees are invited to consider the amendments and to endorse the proposal.

Annex

Proposed amendments to Chapter 2.17 of the GHS and Section 51 of the Manual of Tests and Criteria

Amendments compared to the current text (GHS Rev.9 and Section 51 of the Manual of Tests and Criteria) are shown as follows: additions are underlined, ~~deletions are struck through~~.

Amendments to Chapter 2.17 of the GHS

Note: The amendments hereafter take account of the corrections to the GHS in document ST/SG/AC.10/C.4/80, Annex II).

2.17.1.1 Amend as follows

“2.17.1.1 Desensitized explosives are substances and mixtures in the scope of Chapter 2.1 ~~solid or liquid explosive substances or mixtures~~ which are phlegmatized to suppress their explosive properties in such a manner that they meet the criteria as specified in 2.17.2 and thus do not mass explode and do not burn too rapidly and therefore may be exempted from the hazard class “Explosives” (Chapter 2.1; see paragraph 2.1.1.2.2).⁴²”

Delete footnote 1 to paragraph 2.17.1.1.

2.17.2 Replace current text with the following:

“2.17.2 Classification criteria

2.17.2.1 An explosive which is phlegmatized should be considered in this class if, in that state, the exothermic decomposition energy is ≥ 300 J/g.

NOTE 1: The exothermic decomposition energy may be estimated using a suitable calorimetric technique (see section 20, sub-section 20.3.3.3 in Part II of the Manual of Tests and Criteria).

NOTE 2: Substances and mixtures with an exothermic decomposition energy < 300 J/g should be considered for other physical hazard classes (e.g. as flammable liquids or flammable solids).

2.17.2.2 An explosive which is phlegmatized should be considered in this class if, in that state, it meets the following criteria:

- (a) It is not intended to produce a practical explosive or pyrotechnic effect; and
- (b) it is phlegmatized to an extent that,
 - (i) it has no mass explosion hazard according to test 6 (a) or 6 (b) of the Manual of Tests and Criteria; and
 - (ii) it is not too sensitive or thermally unstable according to test series 3 of the Manual of Tests and Criteria;or that
- (iii) it is too insensitive for inclusion into in the class of explosives according to test series 2 of the Manual of Tests and Criteria; and
- (c) it has no mass explosion hazard and a corrected burning rate ≤ 1200 kg/min according to the burning rate test of sub-section 51.4 of the Manual of Tests and Criteria.

NOTE: Substances and mixtures which do not meet the criteria of 2.17.2.2 should be classified as explosives (see Chapter 2.1).

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)."

Current paragraph 2.17.2.2 becomes new paragraph 2.17.2.4.

Current paragraphs 2.17.3 and 2.17.4 remain unchanged.

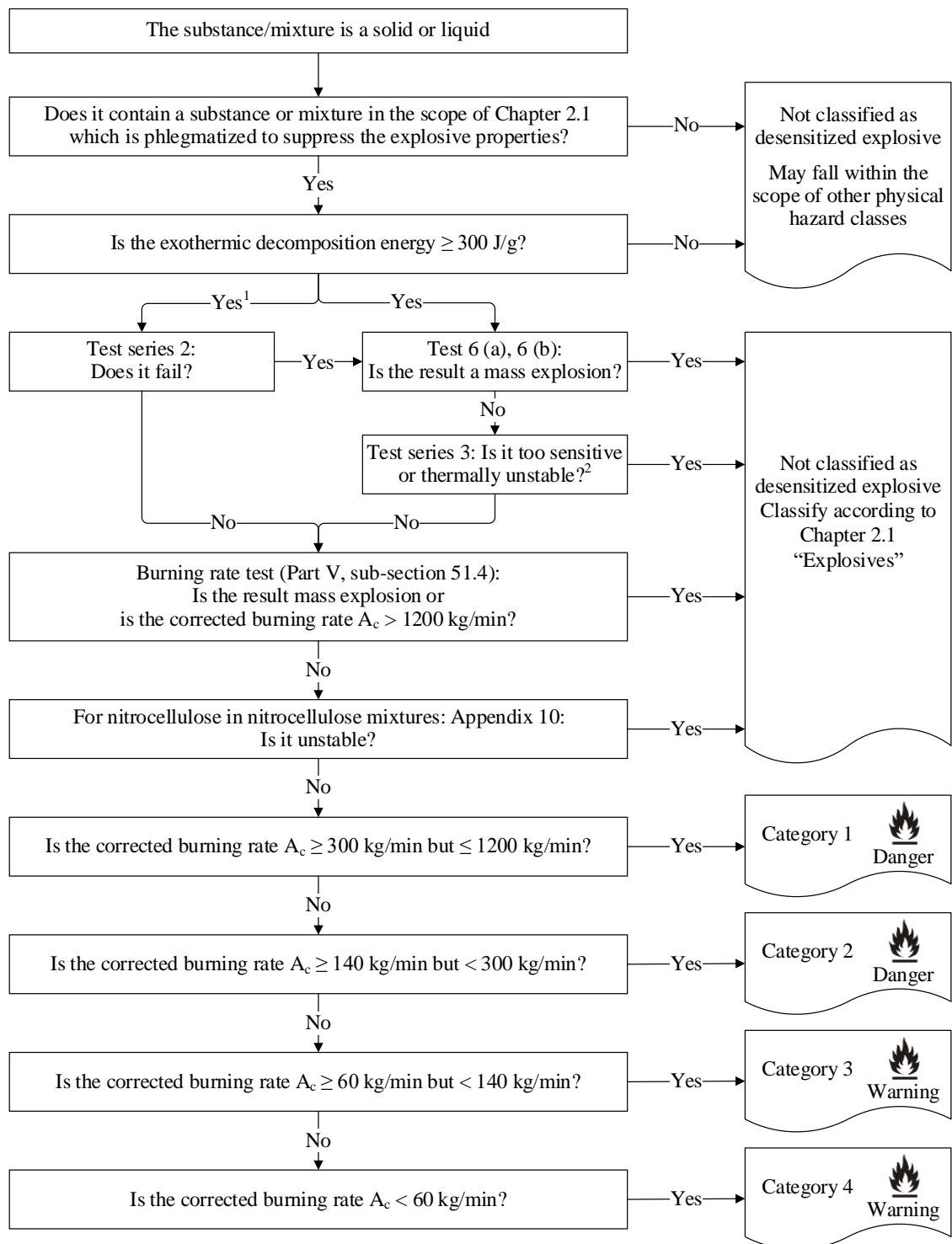
2.17.4.1 Amend as follows:

"2.17.4.1 Decision logic

To classify desensitized explosives, data for the sensitivity, thermal stability, explosive potential and the corrected burning rate should be determined as described in Part I and Part V of the *Manual of Tests and Criteria*. For nitrocellulose, additional data for the stability as described in Appendix 10 of the *Manual of Tests and Criteria* are needed in order to be used in nitrocellulose mixtures considered for this class. Classification is according to decision logic 2.17.1."

Decision logic 2.17.1 Replace with the following:

Decision logic 2.17.1 for desensitized explosives



Insert the following footnotes:

¹ Test series 2 is optional. The alternative route (via test 6 (a) and (b) and test series 3) may be taken directly without performing test series 2.

² Test series 3 is not applicable to nitrocellulose mixtures containing no other explosives than nitrocellulose.

Current paragraph 2.17.4.2 remains unchanged.

Amendments to the Manual of Tests and Criteria, Section 51

51.1.1 In the last sentence of the first paragraph insert “sections 12 and 13 and” before “sub-sections 16.4 and”

51.2 Amend as follows:

“51.2 Scope

51.2.1 Desensitized explosives are substances and mixtures in the scope of Chapter 2.1 of the GHS solid or liquid explosive substances or mixtures which are phlegmatized to suppress their explosive properties in such a manner that they meet the criteria as specified in 2.17.2 of the GHS and thus may be exempted ~~excluded~~ from the hazard class “Explosives” (Chapter 2.1 of GHS).

51.2.2 Desensitized explosives, should be ~~first tested~~ Any explosive while in a desensitized state shall be considered in this class unless, in that state

- (a) for their exothermic decomposition energy¹, if attempting to exit the class of desensitized explosives; It is intended to produce a practical explosive or pyrotechnic effect;
- (b) according to the tests series 1 (type 1 (a)), test series 2 and 3 and tests 6 (type (a) and (b), respectively) of this Manual²; and according to the classification procedure in section 51.3, to preclude a mass explosion in the corrected burning rate test; It has a mass explosion hazard according to Test Series 6(a) or 6(b) or the corrected burning rate according to the burning rate test 51.4 is more than 1 200 kg/min;
- (c) according to the corrected burning rate test; The exothermic decomposition energy is less than 300 J/g².
- (d) and nitrocellulose should be tested according to Appendix 10 of this Manual in order to be used in nitrocellulose mixtures.”.

Delete current footnote 1 (“Unstable explosives...safety data sheet”). Existing footnote 2 becomes footnote 1.

51.3 Amend as follows:

“51.3 Classification procedure

51.3.1 Before packaged substances or mixtures are subjected to the burning rate test, tests as specified below should be performed to rule out the possibility of mass explosion. the test series 6 types 6 (a) and 6 (b) shall be performed in alphabetical order. According to test 6 (a), The substances and or mixtures should be tested first with a standard detonator (Appendix 1 of the Manual) and, if no explosion occurs, with an igniter just sufficient (but not more than 30 g of black powder) to ensure ignition of the substance or mixture in the packaging. The initiation system giving If there is a positive result in test 6 (a), test 6 (b) should be performed with the initiation system causing the positive result in test 6 (a), used for the 6 (b) test.

51.3.2 ~~However, it~~ It is not always necessary to conduct tests of all types:-

- (a) Test series 3 may be waived if the explosive itself (i.e. before phlegmatized) is not too sensitive or thermally unstable according to test series 3.
- (b) Test series 3 and tests 6 (a) and (b) may be waived if test series 2 has been passed.
- (c) Test series 3 is not applicable to nitrocellulose mixtures containing no other explosives, for which stability of the nitrocellulose is established according to Appendix 10.
- (d) Tests 6 (a) and 6 (b) may be modified or waived according to section 51.3.3.

- (e) Test ~~type-6~~ (b) may be waived if in each type 6 (a) test:
 - (i**a**) The exterior of the package is undamaged by internal detonation and/or ignition; or
 - (i**b**) The contents of the package fail to explode, or explode so feebly as would exclude propagation of the explosive effect from one package to another in test ~~type-6~~ (b).

51.3.3 If a substance or mixture gives a negative result (no propagation of detonation) in ~~the Series 1 type test 1 (a) test, the test 6 (a) test~~ with a detonator may be waived³². If a substance or mixture gives a negative result (no or slow deflagration) in ~~a Series 2 type test 2 (c) test, the test 6 (a) test~~ with an igniter may be waived.

51.3.4 The test for determination of the burning rate by large-scale test need not be performed if, in ~~a test type-6 (b)~~, there is practically instantaneous explosion of virtually the total contents of the stack. In such cases the product is assigned to ~~Division 1.1~~ the class of explosives (see Chapter 2.1 of the GHS).”

Renumber current footnote 3 as footnote 2 and amend as follows: ³² ~~If the type test 1 (a) test is not carried out, test the Series 6 type-6 (a) test cannot be waived.~~”.

[The remainder of the text of section 51 remains unchanged].
