

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

24 June 2022

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

Sixtieth session

Geneva, 27 June-6 July 2022

Item 10 (c) of the provisional agenda

**Issues relating to the Globally Harmonized System
of Classification and Labelling of Chemicals:
miscellaneous**

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

Forty-second session

Geneva, 6-8 July 2022

Item 2 (i) of the provisional agenda

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

**Consequential amendments to INF.8 (GHS) - INF.28 (TDG)
(Amendments for desensitized explosives)**

**Transmitted by the experts from Germany and the United States of
America¹**

1. Informal document INF.8 (GHS, 42nd session) and INF.28² (TDG 60th session) propose some amendments to Chapter 2.17 of the GHS but do not contain the necessary consequential amendments yet. These are proposed in this document as follows:

- (a) Annex I contains consequential amendments within Chapter 2.17 of the GHS, especially for the decision logic.
- (b) Annex II contains consequential amendments to Section 51 of the Manual of Tests and Criteria.

(Within the annexes, explanatory remarks are in brackets; these are for the understanding of experts and not optional amendments of the text of the GHS or the Manual.)

2. In addition to the explanations and justification already given in informal documents INF.8 (GHS 42nd session) and INF.28 (TDG, 60th session), the authors would like to emphasize that the proposal in these documents and in this document:

- (a) do not include changes to the transport regulations. The proposed amendments concern the GHS and Section 51 of the Manual of Tests and Criteria only. Section 51 of the Manual belongs to Part V which is “relating to Sectors other than transport” and
- (b) and would improve harmony with transport. Failing test series 3 and/or Appendix 10 of the Manual prevents transport as desensitized explosives (in class 3 or 4.1) and adding references to test series 3 and Appendix 10 in the Criteria section of Chapter 2.17 of the GHS would achieve that they also may not be classified as desensitized explosives acc. to the GHS.

¹ based on paragraphs 28 to 31 of the report of the GHS Sub-Committee on its forty-first session (ST/SG/AC.10/C.4/82) and paragraph 81 of the report of the TDG Sub-Committee on its fifty-ninth session (see ST/SG/AC.10/C.3/118).

² Informal document INF.28 (60th session) contains the same proposal as informal document INF.8 (42nd session).

3. The sub-committees are invited to consider the consequential amendments in the light of the proposal as presented in informal documents INF.8 (GHS, 42nd session) and INF.28 (TDG, 60th session).

Annex I

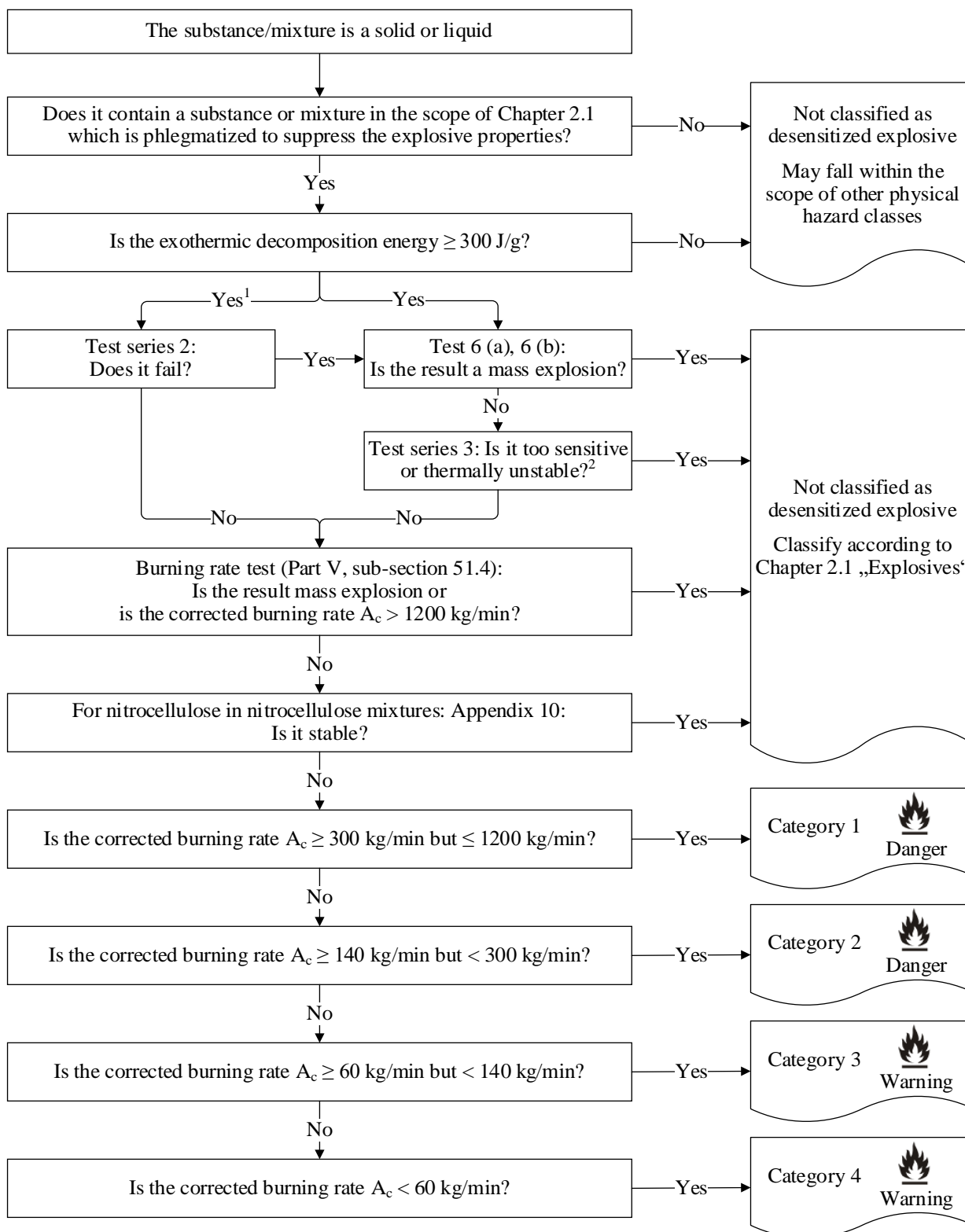
Consequential amendments in 2.17.4.1 of Chapter 2.17 of the GHS

(Amendments compared to the current text are shown as follows: additions are underlined, deletions in ~~striketrough~~.)

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 in nitrocellulose mixtures, additional data for the stability as described in in Appendix 10 of the *Manual of Tests and Criteria* are needed. Classification is according to decision logic 2.17.1.

Decision logic 2.17.1 for desensitized explosives
(amendments within the decision logic are not shown)



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.

Annex II

Amendments to Section 51 of the Manual of Tests and Criteria

(Amendments compared to the current text are shown as follows: additions are underlined, deletions in ~~strike through~~.)

51.1 Purpose

51.1.1 This section presents the United Nations scheme of the classification of liquid and solid desensitized explosives (see Chapter 2.17 of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)). The text should be used in conjunction with the classification principles of Chapter 2.17 of the GHS and the test series given in sections 12 and 13 and sub-sections 16.4 and 16.5 of this Manual.

For testing of liquid desensitized explosives for transport purposes, refer to section 32, sub-section 32.3.2 of this Manual and to Chapter 2.3, sub-section 2.3.1.4 of the Model Regulations. Testing of solid desensitized explosives for transport purposes is addressed in section 33, sub-section 33.3 of this Manual and in Chapter 2.4, sub-section 2.4.2.4 of the Model Regulations.

51.2 Scope

(The wording of 51.2.1 is amended to reflect exactly the wording proposed for the definition in 2.17.1.1 of the GHS. Furthermore, it is proposed to delete 51.2.2 (and instead to divide 51.2.1) because the criteria are laid down in Chapter 2.17 of the GHS. Repetition might cause problems should further changes be introduced later at one place while an according change at the other place might be overlooked. Alternatively, they should be reproduced exactly as in the GHS, however, this is not the preferred option by the authors. References to tests are worded as in the respective sub-section headlines of the Manual, e.g. as in 11.4.1.)

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

- (a) for their exothermic decomposition energy¹, if attempting to exit the class of desensitized explosives;
- (b) according to the tests ~~series 1 (type 1 (a)), test series 2, 3 and tests 6 (type (a) and (b), respectively)~~ of this Manual², according to the classification procedure in section 51.3, to preclude a mass explosion in the corrected burning rate test;
- (c) according to the corrected burning rate test;
- (d) and nitrocellulose in nitrocellulose mixtures should be tested according to Appendix 10 of this Manual.

¹ (Footnote 1 is deleted and former footnote 2 now becomes footnote 1).

² The exothermic decomposition energy should be determined using the explosive already desensitized (i.e.: the homogenous solid or liquids mixture formed by the explosive and the substance(s) used to suppress its explosive properties). 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 this Manual).

~~51.2.2 Any explosive while in a desensitized state shall be considered in this class unless, in that state:~~

- ~~(a) It is intended to produce a practical explosive or pyrotechnic effect;~~
- ~~(b) 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) The exothermic decomposition energy is less than 300 J/g².~~

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~~ 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 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:~~
 - ~~(ia) The exterior of the package is undamaged by internal detonation and/or ignition; or~~
 - ~~(iib) 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).~~

³² ~~If the type test 1 (a) test is not carried out, test the Series 6 type-6 (a) test cannot be waived.~~

(No amendments are foreseen in the further text of Section 51.)