



---

**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**  
**Forty-second session**  
Geneva, 3 – 11 December 2012  
Item 7 of the provisional agenda  
**New proposals for amendments to the  
Model Regulations on the Transport  
of Dangerous Goods**

**Sub-Committee of Experts on the Globally Harmonized  
System of Classification and Labelling of Chemicals**  
**Twenty-fourth session**  
Geneva, 12 – 14 December 2012  
Item 2 (a) of the provisional agenda  
**Updating of the Globally Harmonized System of  
Classification and Labelling of Chemicals (GHS):  
physical hazards**

**Editorial clarification of a screening procedure for potential  
explosives in the Manual of Tests and Criteria and in the  
GHS**

**Transmitted by the expert from Sweden<sup>1</sup>**

**Introduction**

1. Appendix 6 of the Manual of Tests and Criteria lists a number of screening procedures for various transport of dangerous goods (TDG) classes. With the same test methods being applied also in the GHS for physical hazards, these screening methods also are used in the classification according to GHS criteria.
2. The screening procedures for substances which may have explosive properties are described in section 3 of Appendix 6 of the Manual of Tests and Criteria. [If a substance (or mixture) can be inferred to not have explosive properties based on these procedures,] [If, based on these procedures it can be inferred that a substance (or mixture) does not have explosive properties,] it may be exempted from having to be tested for possible inclusion in Class 1. Exemption from testing for possible inclusion in the hazard class “Explosives” of the GHS may be granted on the same grounds (see paragraph 2.1.4.2.2 in Chapter 2.1 of the GHS).

---

<sup>1</sup> In accordance with the programme of work of the Sub-Committee for 2011–2012 approved by the Committee at its fifth session (refer to ST/SG/AC.10/C.3/76, para. 116 and ST/SG/AC.10/38, para. 16).

3. As the testing according to the procedures for Class 1 (TDG) or Explosives (GHS) is rather time-consuming and expensive, it is much worth to industry if a product can be excluded from it through screening. Since both the Model Regulations and the GHS are transposed into legally binding documents such as the ADR/RID and the European Union classification, packaging and labelling (CLP) Regulation<sup>2</sup>, also the screening procedures become part of the legal instruments for classification. It is therefore important that they are correct and unambiguous in order to minimise costs for industry and differing interpretations on their applicability.

## Problem

4. The current wording sub-paragraph 3.3 (c) in the screening procedures for explosive properties in Appendix 6 of the Manual of Tests and Criteria is:

*”When the organic substance or a homogenous mixture of organic substances contain chemical groups associated with explosive properties but the exothermic decomposition energy is less than 500 J/g and the onset of exothermic decomposition is below 500 °C. (The temperature limit is to prevent the procedure being applied to a large number of organic materials which are not explosive but which will decompose slowly above 500 °C to release more than 500 J/g.) The exothermic decomposition energy may be determined using a suitable calorimetric technique (see 20.3.3.3); or”*

5. Breaking the text down, the first sentence could easily be read to state that two separate conditions must be fulfilled in order to exempt a substance from testing, namely:

- (i) The decomposition energy ( $E_{\text{dec}}$ ) should be less than 500 J/g, and
- (ii) The onset temperature of exothermic decomposition ( $T_{\text{onset}}$ ) should be below 500 °C.

6. After this initial sentence containing the criteria, it is explained within brackets that the condition of the temperature limit is meant to prevent the procedure from being applied to materials that are not explosive but will decompose at temperatures above 500 °C releasing more than 500 J/g.

7. An organic substance with  $E_{\text{dec}} < 500$  J/g contains too little energy to be regarded as being a potential explosive, and it fulfils condition (i) above. However, if its  $T_{\text{onset}}$  is 500 °C or higher, it will not be allowed to escape testing, since it does not fulfil condition (ii) above. Such a substance should, however, be allowed to escape testing.

8. An organic substance with  $E_{\text{dec}} \geq 500$  J/g could in principle be explosive, but as explained within brackets just after the criteria, such a substance should be allowed to escape testing if  $T_{\text{onset}}$  is 500 °C or higher.

9. The criteria as worded in sub-paragraph 3.3 (c) are thus ambiguous (at the least) and need to be clarified. As it is clear from the sentence in brackets in the current wording what the intention is, the proposed clarification (below) should be regarded as an editorial correction. No changes to the screening criteria are thus proposed – only a clarification of the already existing ones.

---

<sup>2</sup> Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

## Proposal

10. Amend the first sentence in 3.3 (c) of the screening for explosive properties in Appendix 6 of the Manual of Tests and Criteria as follows (Text to be deleted is shown in bold strike-through; text to be added is shown in bold underline)

*"When the organic substance or a homogenous mixture of organic substances contain chemical groups associated with explosive properties but the exothermic decomposition energy is less than 500 J/g ~~and or~~ the onset of exothermic decomposition is ~~below~~ at least 500 °C."*

11. The new wording of sub-paragraph (c) would then become:

*"When the organic substance or a homogenous mixture of organic substances contain chemical groups associated with explosive properties but the exothermic decomposition energy is less than 500 J/g or the onset of exothermic decomposition is at least 500 °C. (The temperature limit is to prevent the procedure being applied to a large number of organic materials which are not explosive but which will decompose slowly above 500 °C to release more than 500 J/g.) The exothermic decomposition energy may be determined using a suitable calorimetric technique (see 20.3.3.3); or"*

The proposed new wording is unambiguous and, as shown in this table, achieves the proper selection:

| <b>E<sub>decomp</sub></b> | <b>T<sub>onset</sub></b> | <b>Outcome new proposed wording</b>                    |
|---------------------------|--------------------------|--|
| < 500 J/g                 | < 500 °C                 | No testing required.                                   |
| < 500 J/g                 | ≥ 500 °C                 | No testing required.                                   |
| ≥ 500 J/g                 | < 500 °C                 | Testing required (unless any other screening applies). |
| ≥ 500 J/g                 | ≥ 500 °C                 | No testing required.                                   |

## Consequential amendments to the GHS

12. Since the screening criteria of the Manual of Tests and Criteria are repeated in the GHS, Chapter 2.1 (Explosives), the corresponding changes need to be made there as well. Therefore, amend the first sentence in paragraph 2.1.4.2.2 (c) in Chapter 2.1 of the GHS as follows (Text to be deleted is shown in bold strike-through text words to be added is shown in bold underline):

*"When the organic substance or a homogenous mixture of organic substances contain chemical groups associated with explosive properties but the exothermic decomposition energy is less than 500 J/g ~~and or~~ the onset of exothermic decomposition is ~~below~~ at least 500 °C."*

13. The text in 2.1.4.2.2 (c) would then become:

*"When the organic substance or a homogenous mixture of organic substances contain chemical groups associated with explosive properties but the exothermic decomposition energy is less than 500 J/g or the onset of exothermic decomposition is at least 500 °C. (The temperature limit is to prevent the procedure being applied to a large number of organic materials which are not explosive but which will decompose slowly above 500 °C to release more than 500 J/g.) The exothermic decomposition energy may be determined using a suitable calorimetric technique; or"*