



---

**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****Fifty-fourth session**

Geneva, 26 November–4 December 2018

Item 7 (d) of the provisional agenda

**Issues relating to the Globally Harmonized System  
of Classification and Labelling of Chemicals:  
use of the Manual of Tests and Criteria in the  
context of the GHS****Sub-Committee of Experts on the Globally Harmonized  
System of Classification and Labelling of Chemicals****Thirty-sixth session**

Geneva, 5–7 December 2018

Item 3 (a) of the provisional agenda

**Classification criteria and related hazard communication:  
Work of the Sub-Committee of Experts on the Transport  
of Dangerous Goods (TDG) on matters of interest to the  
GHS Sub-Committee****Use of the Manual of Tests and Criteria in the context of  
GHS****Transmitted by the Chairman of the Working Group on Explosives of  
the Sub-Committee of Experts on the Transport of Dangerous Goods  
(TDG Sub-Committee) on behalf of the Working Group\***

1. This document contains the proposed list of amendments to Part II, Sections 20 to 28 of the sixth revised edition of the Manual of Tests and Criteria, including Amendment 1, to take account of its use in the context of the GHS, for consideration by both sub-committees.
2. For practical reasons, the text of Part II of the Manual of Tests and Criteria with the proposed changes in visible mode is circulated separately, in English only, in informal document INF.3.

---

\* In accordance with the programme of work of the Sub-Committee for 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, para. 14).

## General table of contents

PART II: Title page:

Replace “SELF-REACTIVE SUBSTANCES OF DIVISIONS 4.1 AND ORGANIC PEROXIDES OF DIVISION 5.2” with “SELF-REACTIVE SUBSTANCES, ORGANIC PEROXIDES AND POLYMERIZING SUBSTANCES”.

CONTENTS OF PART II

Delete sections 21.4.2 and 26.4.5 from the table of contents.

## Section 20

20.1.1 In the first sentence make the following amendments:

- replace “of Division 4.1 and” by a comma and
- replace “of Division 5.2 (see respectively sub-section 2.4.2.3 and section 2.5.3 of the Model Regulations)” by “and the determination of the self-accelerating polymerization temperature (SAPT) for polymerizing substances”

In the second sentence:

- replace the “It” at the start of the sentence by “For self-reactive substances and organic peroxides it”
- delete: “for providing competent authorities with the necessary information” and “for transport”.

In the third sentence:

- delete “(Division 4.1)” and replace “(Division 5.2) and” by a comma
- replace “(see also 2.4.2.3.3 and 2.5.3.3 in the Model Regulations)” by “of this Manual, sub-sections 2.4.2.3 and 2.5.3 of the Model Regulations and Chapters 2.8 and 2.15 of the GHS”.

20.1.2 Amend the last sentence to read: “The classification tests should be performed in the second stage.”

20.2.1 Delete the words “offered for transport” in the first sentence.

- (a) Replace “according to the criteria of Class 1” by “(see Part I)”
- (b) Delete “according to the classification procedure for Division 5.1” and replace “defined” by “described”

Note to (b), first sentence: delete: “meeting the criteria of Division 5.1” and “above”.

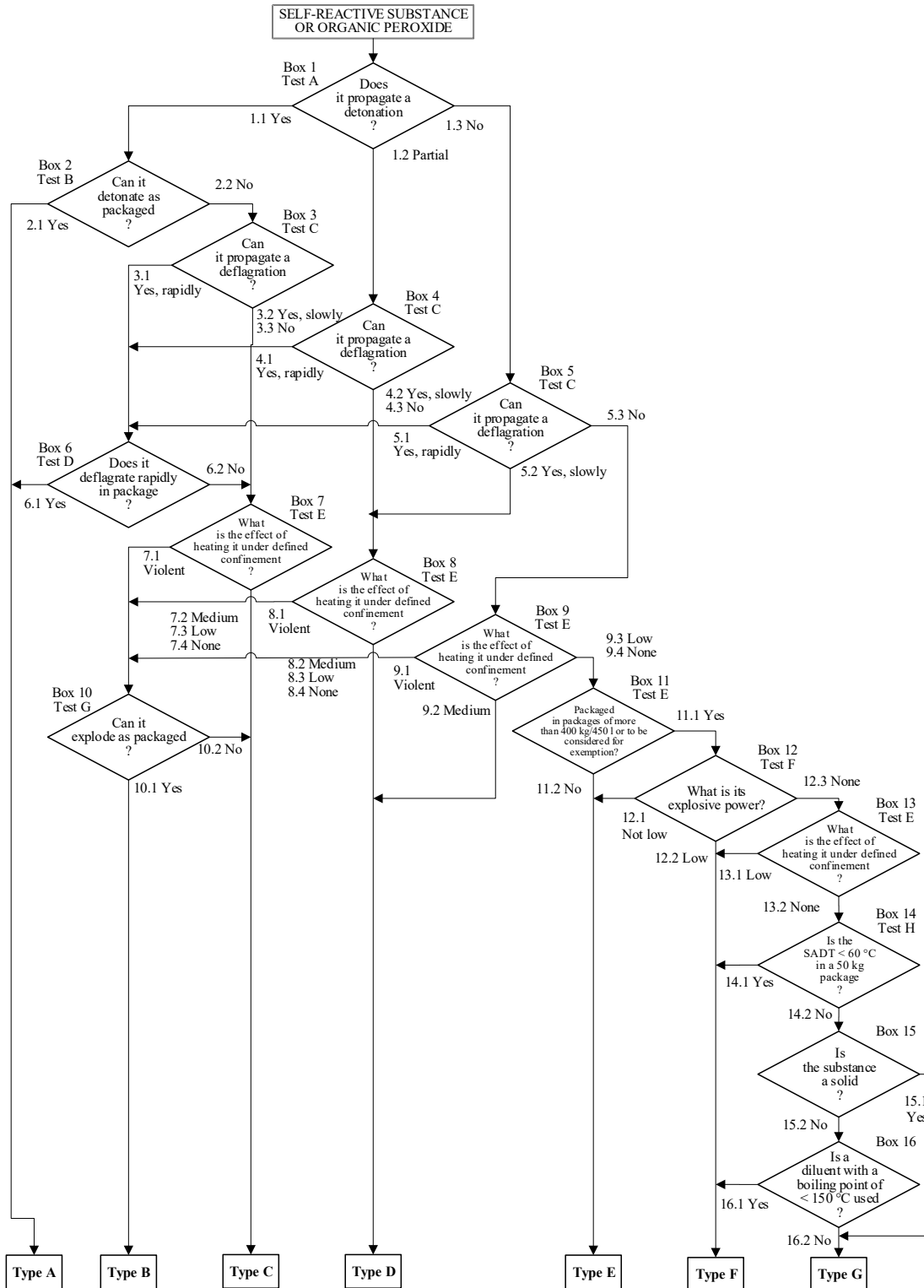
Note to (b), second sentence: at the end add: “For GHS purposes type G should be considered in this respect as well.”

Note to (b), third sentence: replace “a substance of Division 5.1” by “an oxidising substance”

- (c) Replace “according to the criteria of Division 5.2” by “(see 20.2.2)”

- (e) At the end, replace the full stop (.) by “; or” and insert a new indent (f), reading “They are polymerizing substances according to 2.4.2.5 of the Model Regulations.”
- 20.2.2 Delete “offered for transport” and “classification” in the first sentence.
- 20.2.3 In the first sentence delete “, in the opinion of the competent authority,”
- (a) Replace “paragraph 2.4.2.3.1.1 of the Model Regulations” by “20.2.1”
- (c) Replace “paragraph 2.5.1 of the Model Regulations” by “20.2.2”
- 20.2.4 In the first sentence, insert “in the dangerous goods list of Chapter 3.2 of the Model Regulations” between “entry” and “may”
- 20.2.5 delete the whole paragraph, renumber 20.2.6 to 20.2.5 and amend as follows. In the first sentence amend “(except Type G) should” to read “(Type A to Type G) should” and replace the rest of the sentence with: “not be tested in the self-heating test N.4, as the test result will give a false positive result (i.e. temperature increase due to thermal decomposition rather than oxidative self-heating).”
- 20.2.6 Insert a new paragraph 20.2 6 reading:
- “20.2.6 Substances capable of polymerization should be subjected to the classification procedures for polymerizing substances in Chapter 2.4, section 2.4.2.5 of the Model Regulations, unless:
- (a) Their self-accelerating polymerization temperature (SAPT) is greater than 75 °C under the conditions (with or without chemical stabilization as offered for transport) and in the packaging, IBC or portable tank in which the substance or mixture is to be transported; or
- (b) They exhibit a heat of reaction of less than or equal to 300 J/g; or
- (c) They meet any other criteria for inclusion in transport classes 1 to 8.
- A mixture meeting the criteria of a polymerizing substance shall be classified as a polymerizing substance of Division 4.1 for transport.
- NOTE:** If a polymerizing substance meets the criteria for inclusion in transport classes 1 to 8, the SAPT shall be determined to evaluate if temperature control is needed (see paragraph 2.4.2.5.2 of the Model Regulations)”.
- 20.3.3.2 Delete “Class 1” and insert “for the class of explosives” between “procedure” and “(see Part I)”.

Figure 20.1(a): Renumber to 20.1 and replace the figure and its heading with the following



Delete Figure 20.1(b)

Add the following note to new figure 20.1

Note: For transport:

- Type A: not accepted for transport in that packaging;
- Type B: accepted for transport in packages of not more than 25 kg net mass with an “Explosive” subsidiary hazard label;
- Type C: accepted for transport in packages of not more than 50 kg net mass;
- Type D: accepted for transport in packages of not more than 50 kg net mass;
- Type E: accepted for transport in packages of not more than 400 kg/450 litres;
- Type F: may be considered for transport in IBCs or tanks;
- Type G: shall be considered for exemption.

20.4.1.1 Delete “(see also paragraphs 2.4.2.3.3 and 2.5.3.3 of the Model Regulations)” in the first sentence. At the end of the third sentence replace “the hazard” by “their hazards”. In the fifth line delete “of Division 4.1” and “of Divisions 5.2”.

20.4.1.3 At the end of the first sentence, delete: “as used in transport (see sub-section 2.5.3.4 of the Model Regulations)”.

(a): delete “during transport” at the end

Insert a new paragraph 20.4.1.4 reading:

“20.4.1.4 The self-accelerating polymerization temperature (SAPT) means the lowest temperature at which self-accelerating polymerization may occur with a substance in the packaging, IBC or portable tank as offered for transport. The SAPT should be determined in order to decide if a substance should be subjected to temperature control.”

and renumber old 20.4.1.4 to 20.4.1.5 and old 20.4.1.5 to 20.4.1.6.

new 20.4.1.1.5: insert a footnote at the end of the sentence reading:

“Liquid means a substance which at 50 °C has a vapour pressure of not more than 300 kPa (3 bar), which is not completely gaseous at 20 °C and at a pressure of 101.3 kPa, and which has a melting point or initial melting point of 20 °C or less at a pressure of 101.3 kPa. A viscous substance for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).”

20.4.2 Replace the first sentence by “Self-reactive substances are classified in one of the seven categories “Types A to G” according to the following principles:” and insert a footnote “2” reading: “For transport, these principles should be applied to the classification of self-reactive substances not listed in the Table of paragraph 2.4.2.3.2.3 of the Model Regulations.”

At the start of indents (a) through (g) insert “self-reactive” between “Any” and “substance”.

- (a) After “substance which”, amend to read: “, as packaged, can detonate or deflagrate rapidly will be defined as self-reactive substance Type A;”
- (b) Delete “for transport”; after “that package,” replace the rest of the paragraph with “will be defined as self-reactive substance Type B;”
- (c) Delete “may be transported without an “EXPLOSIVE” subsidiary risk label” and “(maximum 50 kg) for transport”, amend the end of the paragraph to read” ... thermal explosion will be defined as self-reactive substance Type C;”
- (d) Amend the last part (after indent iii) to read: “will be defined as self-reactive substance Type D;”
- (e) Delete: “may be accepted for transport in packages of not more than 400 kg/450 litres” and amend the end of the paragraph to read” ... be defined as self-reactive substance Type E;”
- (f) Amend the end to read: “... or no explosive power will be defined as self-reactive substance Type F;”
- (g) Delete: “should be exempted from classification as a self-reactive substance of Division 4.1” and replace “the formulation” by “it”. Amend the end of the paragraph to read: “...50 kg package) and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as self-reactive substance Type G. If the mixture is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, the mixture shall be defined as self-reactive Type F.”

20.4.3

Replace the first sentence by “Organic peroxides are classified in one of the seven categories “Types A to G” according to the following principles” and insert a footnote “3” reading: “For transport, these principles should be applied to the classification of organic peroxides not listed in the Table of paragraph 2.5.3.2.4 of the Model Regulations.”

At the start of indents (a) through (g) delete “formulation”.

- (a) After “peroxide which”, amend to read: “, as packaged, can detonate or deflagrate rapidly will be defined as organic peroxide Type A;”
- (b) Delete “for transport”; after “that package” replace the rest of the paragraph with “will be defined as organic peroxide Type B;”
- (c) Delete “may be transported without an “EXPLOSIVE” subsidiary risk label” and “(maximum 50 kg) for transport”, amend the end of the paragraph to read” ... thermal explosion will be defined as organic peroxide Type C;”
- (d) Amend the last part (after indent iii) to read: “will be defined as organic peroxide Type D;”
- (e) Delete: “is acceptable for transport in packages of not more than 400 kg/450 litres” and amend the end of the paragraph to read” ... will be defined as organic peroxide Type E;”

(f): Amend the end to read "... or no explosive power will be defined as organic peroxide Type F;"

(g): Delete: "should be exempted from Division 5.2" and replace "that the formulation" by "it". Amend the end of the paragraph to read: "...50 kg package) and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as organic peroxide Type G. If the mixture is not thermally stable or a diluent having a boiling point less than 150 °C is used for desensitization, it shall be defined as organic peroxide Type F."

Insert a new paragraph 20.4.4, reading:

**“20.4.4 Classification of polymerizing substances for transport**

20.4.4.1 Polymerizing substances are substances which, without stabilization, are liable to undergo a strongly exothermic reaction resulting in the formation of larger molecules or resulting in the formation of polymers under conditions normally encountered in transport. Such substances are considered to be polymerizing substances of Division 4.1 for transport when:

- (a) Their self-accelerating polymerization temperature (SAPT) is 75 °C or less under the conditions (with or without chemical stabilization as offered for transport) and in the packaging, IBC or portable tank in which the substance or mixture is to be transported; and
- (b) They exhibit a heat of reaction of more than 300 J/g; and
- (c) They do not meet any other criteria for inclusion in classes 1 to 8.

20.4.4.2 Based on their SAPT and physical state, polymerizing substances are classified for transport purposes as:

- (a) Polymerizing substance, solid, stabilized
- (b) Polymerizing substance, liquid, stabilized
- (c) Polymerizing substance, solid, stabilized, temperature controlled
- (d) Polymerizing substance, liquid, stabilized, temperature controlled”

Re-number subsequent paragraphs to 20.4.5(x) and 20.4.6(x) respectively.

In the re-numbered paragraphs 20.4.5.4; 20.4.5.6 and 20.4.5.9 delete: “for transport”.

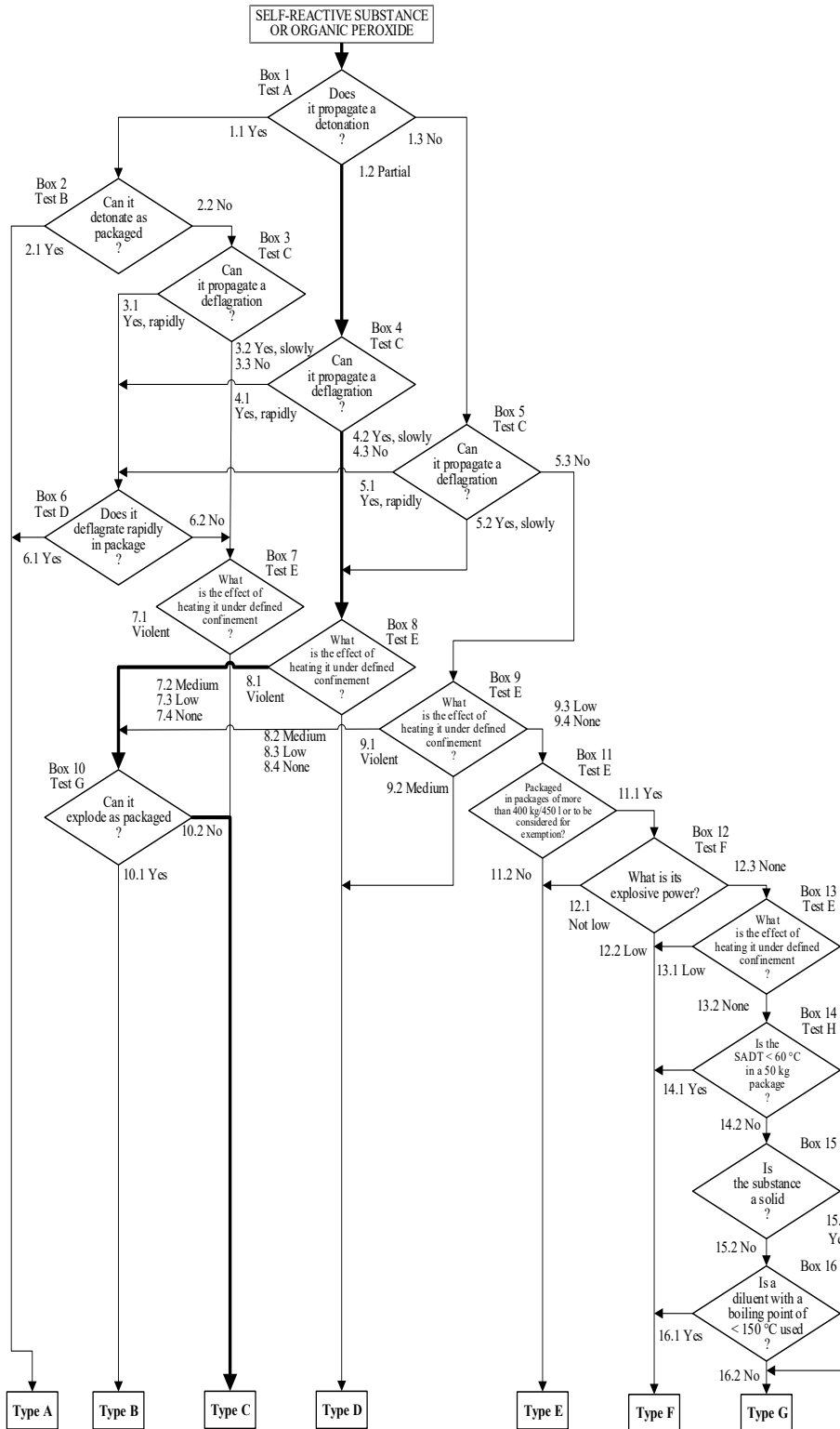
In new paragraph number 20.4.5.8 replace “transport” by “containment”.

Add to the end of re-numbered paragraph 20.4.5.10 “and for the determination of the self-accelerating polymerization temperature”

20.5.2 replace “transported” by “classified”

Figure 20.2 amend the question in line 3 to read “Does it propagate...” and amend the question in line 4 to read “Can it propagate...”. In Line 6, replace the “the substance” by “it” and delete “for transport”.

Replace the current figure 20.3 with the following:





## Section 21

- 21.2.1 In the second sentence, replace “transport” by “containment”.
- 21.2.2 In the sub-paragraph after indent (b), delete “For transport in packages excluding IBCs),” and capitalise “if”. In the second sentence replace “transport” by “containment”.
- 21.3.2 delete “during transport”.
- 21.3.3 Replace “to be transported under” by “likely to encounter”
- 21.4.2 Delete entire sub-section.

## Section 22

- 22.1 Delete “for transport” in the first sentence.
- 22.2 Delete “for transport” in the first sentence.
- 22.3.1 Insert “substances in” between “applied to” and “packages”; delete “of substance” and replace “transport” by “classification”.
- 22.4.1.1 At the end of the first sentence, delete “as for transport”.
- 22.4.1.3 In the first sentence, replace “transport” by “classification”.

## Section 24

- 24.1 At the end of the first sentence, delete “for transport”.
- 24.3.1 Replace “transport” by “classification”.
- 24.4.1.1 At the end of the first sentence, delete “as for transport”.
- 24.4.1.3 Replace “transport” by “classification” in the first sentence.

## Section 25

- 25.4.1.2.2 In the fourth sentence replace “dibutyl phthalate” by “silicone oil, apparent density  $0.96 \pm 0.02$  at  $20\text{ }^{\circ}\text{C}$  and heat capacity  $1.46 \pm 0.02\text{ J/g}$  at  $25\text{ }^{\circ}\text{C}$ ”
- 25.4.1.3.1 Footnote 1: In the second sentence, replace “transport” by “packing”.
- [25.4.2.2.2 In the fourth sentence replace “dibutyl phthalate” by “silicone oil, apparent density  $0.96 \pm 0.02$  at  $20\text{ }^{\circ}\text{C}$  and heat capacity  $1.46 \pm 0.02\text{ J/g}$  at  $25\text{ }^{\circ}\text{C}$ ”.
- 25.4.3.3.1 In the second sentence replace “dibutyl phthalate” by “silicone oil, apparent density  $0.96 \pm 0.02$  at  $20\text{ }^{\circ}\text{C}$  and heat capacity  $1.46 \pm 0.02\text{ J/g}$  at  $25\text{ }^{\circ}\text{C}$ ” and replace “the temperature of the dibutyl phthalate” by “it’s temperature”. In the third sentence replace “dibutyl phthalate” by “oil”.]<sup>1</sup>

---

<sup>1</sup> New proposals, to be discussed in the explosives working group

## Section 26

- 26.1.1 In the second sentence replace “transport” by “containment” and delete “of Division 4.1” and “of Division 5.2”.
- 26.4.5 Delete entire sub-section.

## Section 27

- 27.1.1 Delete “for transport” in the first sentence.
- 27.2.1 Delete “for transport”.
- 27.3.1 Replace “transport” by “classification”.
- 27.4.1.3 In the first sentence replace “transport” by “classification”.
- 27.4.2 In the title amend “g.2” to “G.2”.

## Section 28

- 28.1 At the end of the second sentence, delete “as used in transport”.
- 28.2.1 Delete “at transport temperatures”.
- Table 28.1 In footnotes a, b and c amend “transported” to “contained”
- Table 28.2 In the row for portable tanks amend the value of the SADT to read “ $\leq 45$  °C” and delete “for transport” in footnote a.
- 28.2.4 Replace “transported” by “contained”.
- 28.3.2 In the first sentence, delete “to be transported”; in the second sentence delete “transport in”.
- 28.3.5 At the end of the first sentence, delete “offered for transport”.
- [28.3.6 In the second sentence replace “dibutyl phthalate” by “silicone oil, apparent density  $0.96 \pm 0.02$  at 20 °C and heat capacity  $1.46 \pm 0.02$  J/g at 25 °C”.
- 28.4.2.3.1 In indent (a) replace “dibutyl phthalate” by “silicone oil, apparent density  $0.96 \pm 0.02$  at 20 °C and heat capacity  $1.46 \pm 0.02$  J/g at 25 °C” and replace “with a” by “another”.]<sup>2</sup>
- 28.4.4.1.1 At the end of the first sentence, delete “as for transport”.
- 28.4.4.1.2 At the end of the sentence, delete “offered for transport”.
- 28.4.4.2.6 At the end of the first sentence, delete “offered for transport”.

---

<sup>2</sup> New proposals, to be discussed in the explosives working group