

**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

2 December 2016

Fiftieth session

Geneva, 28 November – 6 December 2016

Item 2(b), 6, 7(g) and 7(h) of the provisional agenda

Explosives and related matters, Use of the Manual of Tests and Criteria in the context of the GHS, and Review of Chapter 2.1 of the GHS

Report of the Working Group on Explosives

Transmitted by the chairman of the Working Group on Explosives

Introduction

1. The working group met from 28 November to 2 December 2016 in a parallel session to the plenary meeting of the Sub-Committee on the Transport of Dangerous Goods. This meeting of the working group was well attended with 38 experts in attendance from Australia, Belgium, Canada, Finland, France, Germany, Italy, Japan, Netherlands, Poland, Spain, Sweden, United Kingdom, United States of America, UN/ECE/GHS, Australian Explosives Industry and Safety Group (AEISG), Association of European Manufacturers of Sporting Ammunition (AFEMS), European Chemical Industry Council (CEFIC), European Association of Automotive Suppliers (CLEPA), Council on Safe Transport of Hazardous Articles (COSTHA), Fertilizers Europe, Institute of Makers of Explosives (IME), Sporting Arms & Ammunition Manufacturers' Institute (SAAMI), and the GHS Secretariat. Annex 1 of this report provides a list of participants. The group was tasked to discuss technical matters related to official papers and to discuss informal papers as time allowed. Mr. Ed de Jong (Netherlands) served as chair of the working group and Mr. Timothy Golian (IME) as secretary.

2. The working group met for three days to consider the papers assigned to it by the TDG Sub-Committee and informally on a fourth day while this report was being prepared. The informal discussions conducted on that fourth day are not reported herein.

3. 50/INF.2 listed the following papers for consideration of the working group:

Document	Title
<u>Agenda Item 2(b)</u>	<u>Explosives and related matters</u>
<i>ST/SG/AC.10/C.3/2016/53 - (AEISG)</i>	<i>Chapter 2.1 of the Model Regulations - Class 1 definition^a. Chapter 2.1 of the GHS - Class of explosives</i>
<i>ST/SG/AC.10/C.3/2016/60 - (Sweden, AEISG)</i>	<i>Manual of Tests and Criteria. Proposals to amend section 10.3.3</i>
<i>ST/SG/AC.10/C.3/2016/61 - (CEFIC) UN/SCETDG/50/INF.23 - (CEFIC)</i>	<i>Transport of energetic samples for further testing</i>
<i>ST/SG/AC.10/C.3/2016/66 - (Sweden) UN/SCETDG/50/INF.9 - (AEISG) UN/SCETDG/50/INF.47 - (IME)</i>	<i>Clarification of the classification of ammonium nitrate based fertilizers - proposal for a new section 39 in the Manual of tests and Criteria</i>
<i>UN/SCETDG/50/INF.33 - (Italy) UN/SCETDG/50/INF.44 - (UK)</i>	<i>Application of Security Provisions to Explosives N.O.S.</i>

Document	Title
<u>Agenda Item 6</u>	<u>New proposals for amendments to the Model Regulations on the Transport of Dangerous Goods</u>
<i>UN/SCETDG/50/INF.30 - (AEISG)</i>	<i>New UN entries for Electronic Detonators</i>
<u>Agenda Item 7(g)</u>	<u>Use of the Manual of Tests and Criteria in the context of the GHS</u>
<i>ST/SG/AC.10/C.3/2016/83 - ST/SG/AC.10/C.4/2016/16 - (Chairman of the Working Group on Explosives)</i>	<i>Use of the Manual of Tests and Criteria in the context of GHS</i>
<i>UN/SCETDG/50/INF.7 - UN/SCEGHS/32/INF.5 Add.1 Add.2 Add.3 Add.4 Add.5</i>	<i>Use of the Manual of Tests and Criteria in the context of GHS Table of Contents and General Introduction Part I, Sections 10 – 17 Part I, Section 18 Part II Part III Appendices</i>
<i>UN/SCETDG/50/INF.17 - UN/SCEGHS/32/INF.14 – (USA/Canada)</i>	<i>Comments on proposed amendments to the Manual of Tests and Criteria (ST/SG/AC.10/C.3/2016/83-ST/SG/AC.10/C.4/2016/16)</i>
<i>UN/SCETDG/50/INF.36 – UN/SCEGHS/32/INF.21 - (Secretariat)</i>	<i>Proposed corrections to the 6th revised edition of the Manual of Tests and Criteria</i>
<i>UN/SCETDG/50/INF.14 - UN/SCEGHS/32/INF.10 - (Germany)</i>	<i>Comments on UN/SCETDG/50/INF.7 and UN/SCEGHS/32/INF.5: Revision of the Manual of Tests and Criteria: Section 1</i>
<u>Agenda Item 7(h)</u>	<u>Review of Chapter 2.1 of the GHS</u>
<i>UN/SCETDG/50/INF.11 - UN/SCEGHS/32/INF.8 - (Sweden)</i>	<i>Status report on the work of the informal correspondence group on the revision of GHS Chapter 2.1</i>
<i>UN/SCETDG/50/INF.18 - UN/SCEGHS/32/INF.15 - (USA)</i>	<i>Comments on the report on the work of the informal correspondence group on the revision of GHS Chapter 2.1 (UN/SCEGHS/32/INF.8 - UN/SCETDG/50/INF.11)</i>

Agenda Item 2(b) – Explosives and related matters

4. **Subject:** Proposal for replacing dibutyl phthalate (DBP) in Koenen Test

Documents: *ST/SG/AC.10/C.3/2016/13 - (France)*

Informal documents: *None*

Discussion: In previous sessions the expert from France informally reported that dibutyl phthalate (DBP) is forbidden for general use within the European Union because it has been identified as a substance of very high concern within the EU's REACH regulation. For that reason France undertook research on a suitable replacement for DBP, including coordinating a round robin test by 3 internationally recognized labs testing potentially suitable alternates. Based on that testing this paper identified suitable alternates.

Conclusion: Adopt specifications for suitable alternates for DBP. See Amendments 1 – 4 in Annex 3 of this report.

5. **Subject:** Chapter 2.1 of the Model Regulations – Class 1 definition
Chapter 2.1 of the GHS – Class of explosives

Documents: *ST/SG/AC.10/C.3/2016/53 - ST/SG/AC.10/C.4/2016/14 - (AEISG)*

Informal documents: *None*

Discussion: The phrase “a practical explosive or pyrotechnic effect”, EXCLUDING THE COMMA, is used in several parts of the existing Model Regulations (nineteenth revised edition), the Manual of Tests and Criteria (sixth revised edition) and the GHS (sixth revised edition). The phrase “a practical, explosive or pyrotechnic effect”, WITH COMMA, appears in 51.2.2 (a) of the Manual of Tests and Criteria (sixth revised edition) and 2.17.2.1 (a) of the GHS. These sections were amended at the forty-ninth session of the TDG Sub-Committee and at the thirty-first session of the GHS Sub-Committee to exclude the comma amongst other things (ST/SG/AC.10/C.3/98, paragraph 138 and ST/SG/AC.10/C.4/62, paragraph 23). AEISG noted that “a practical, explosive or pyrotechnic effect”, WITH COMMA, still appears in several places. Consensus of the EWG is that corrections should be made.

Conclusion: Remove the comma after the word “practical” in 2.1.1.1(c) of the Model Regulations, 2.1.1.2 (c) of the GHS, and Note b to Table 2.1.1 of the GHS. See Amendment 1 in Annex 2 of this report, and Amendments 1 and 2 in Annex 4 of this report.

6. **Subject:** Section 10.3.3 of the Manual of Tests and Criteria (MTC) – guidance about application of Test Series 3 and 4.

Documents: ST/SG/AC.10/C.3/2016/60 - (Sweden, AEISG)

Informal documents: None

Discussion: There was consensus that improved guidance on the application of Test Series 3 and 4 was necessary, with the goal of eliminating unnecessary text, rearranging the order of the paragraphs to reflect proper application, and clearly explain the options for when a substance or article fails any of the tests. There was discussion of whether test series 4 needs to be carried out for all articles or if it could be waived based upon knowledge of the article or from TS3. Although not all were in agreement, it was proposed to add a note in 10.3.3.3 to assist with reciprocity between competent authorities. The proposals to paragraphs 10.3.3.2, 10.3.3.3 and 10.3.3.4 were amended by the work group during this session.

Conclusion: Adopt 10.3.3.2, 10.3.3.3 and 10.3.3.4 as amended by the work group. See Amendment 5 of Annex 3 of this report. Sweden and USA will consider developing further proposals in the next biennium.

7. **Subject:** Transport of energetic samples

Documents: ST/SG/AC.10/C.3/2016/61 - (CEFIC)

Informal documents: UN/SCETDG/50/INF.23 – (CEFIC)

Discussion: There was consensus that specifying standard packaging could provide a safe, efficient means to transport small energetic samples for testing. The standard packaging is based on testing reported on in INF.23 that was considered to be “worst case” because the testing was done with commercial detonators with one gram TNT equivalent. The packaging is intended for smaller size samples that do not contain any known explosives, nor substances showing explosive effects in testing, nor compounds designed with the view of producing a practical explosive or pyrotechnic effect, nor components consisting of synthetic precursors of intentional explosives. The USA recommended adding text to propose 2.0.4.3 to clarify that transport should be limited to testing purposes only, which is consistent with 2.0.4.1.

Conclusion: Adopt standard packaging to Model Regulations Section 2.0.4 as specified in INF.23 (as amended by the working group). See Amendments 2 – 5 in Annex 2 of this report.

8. **Subject:** Classification of ammonium nitrate fertilizers

Documents: ST/SG/AC.10/C.3/2016/66 - (Sweden)

Informal documents: UN/SCETDG/50/INF.9 - (AEISG)
UN/SCETDG/50/INF.47 – (IME)

Discussion: There was considerable discussion and strong consensus that classification of ammonium nitrate (AN) based fertilizers is confusing, and in need of clarification. Currently the procedures can lead to misinterpretations (unintended or deliberate). These misinterpretations can lead to potentially unsafe AN-based fertilizers being transported as non-dangerous goods. As many downstream regulations use the transport classification as a basis for other safety measures, e.g. when storing AN-based fertilizers, the risks associated with these products can transfer further along the supply chain. Apart from the risk this poses to transporters, other workers, rescue personnel and the general public, this also leads to unfair competition amongst suppliers, since the transport and handling of supposedly “non-hazardous material” is cheaper and subject to less regulatory restrictions.

During discussion it was noted that although it is outside the scope of this proposal, it would be desirable to have a better description or criteria for determination of stability in box D4 of the fertilizer classification flowchart. However it was recognized that this situation was very difficult and the new text in 39.3.5 went some ways toward providing guidance and clarification.

USA questioned the condition in 39.4.4 whereby composition places fertilizers in Class 1 even if test series 2 criteria are met. The consensus in the group was that this condition is merely reflecting the restriction in current SP307, where fertilizer with greater than 90% AN and greater than 0.2% total combustible material is Class 1 by definition.

The group discussed concerns which were expressed in INF.9 and INF.47 resulting in amendments to the original proposal.

There was consensus on the working group that the constraint on extra nitrate was an historical carryover and could not identify any safety or security reason why it needed to be retained.

Conclusion: Add a new Section 39, specifically for the classification of AN-based fertilizers. See Amendments 6 in Annex 2 and Amendments 6 in Annex 3 of this report.

9. **Subject:** Application of Security Provisions to Explosives N.O.S.

Documents: None

Informal documents: UN/SCETDG/50/INF.33 – (Italy)
UN/SCETDG/50/INF.44 – (UK)

Discussion: INF.33 proposes adding two new UN entries for situations where Explosives N.O.S. classifications require security provisions. INF.44 expanded that concept to other explosives. After considerable discussion, several in the working group stated that security provisions should be criteria based not UN number based. Consideration of such a concept would require further study, beyond the scope of this biennium. The expert from Italy agreed that an acceptable alternate solution would be to identify required security provisions on specific competent authority approvals for the time being. There was consensus to add Division 1.6 explosives to the high consequence dangerous goods list.

Conclusion: The alternate solution identified above was acceptable to the Italian expert. The working group recommends adding Class 1, Division 1.6 to Table 1.4.1 of the Model Regulations. See Amendment 7. The group felt that further development work is required.

Agenda Item 6 – New proposals for amendments to the Model Regulations on the Transport of Dangerous Goods

10. **Subject:** New UN entries for Electronic Detonators

Documents: None

Informal documents: UN/SCETDG/50/INF.30 - (AEISG)

Discussion: A further range of technologically advanced detonators known as ‘Electronic Detonators’ have been introduced. Such detonators utilise an integrated circuit and/or micro processing technology to provide communications, energy control and storage capability, timing delay information and commands in order. There was discussion on whether these detonators should have UN entries of their own to distinguish them from electric detonators. There were also discussions on whether such UN entries might qualify for Compatibility Group D due to the protective features potentially included within electronic detonators. It was suggested that those interested study the characteristics related to transport safety, and make proposals in the future if they believe the information gathered warrants further consideration. There were no objections from the working group to this suggestion.

Conclusion: Interested parties are requested to make formal proposals.

Agenda Item 7(g) – Use of the Manual of Tests and Criteria in the context of the GHS

11. **Subject:** Revision of the Manual of Tests and Criteria

Documents: ST/SG/AC.10/C.3/2016/83 - ST/SG/AC.10/C.4/2016/16 - (Chairman of the Working Group on Explosives)

Informal documents: UN/SCETDG/50/INF.7 (UN/SCEGHS/32/INF.5) (Working Group Chair) and Adds. 1 – 5
UN/SCETDG/50/INF.14 - UN/SCEGHS/32/INF.10 - (Germany)
UN/SCETDG/50/INF.17 - UN/SCEGHS/32/INF.14 – (USA/Canada)

Discussion: Efforts to edit the text in sections 1 and 10 led to a discussion on the relationship between revisions to the Manual and the scope of GHS chapter 2.1 and whether the tests needed to arrive at division level should be amended to accommodate GHS if testing will only be carried out in transport packaging. After further discussion, it was decided to focus on the remainder of Part I, as well as the appendices. As suggested by the USA and Canada in INF.17, it was agreed that amendments to the introductory texts and the rest of the Manual should be addressed further in the next biennium. This document contains the proposed list of amendments to the sixth revised edition of the Manual of Tests and Criteria to take account of its use in the context of the GHS.

Conclusion: Adopt agreed amendments. See Amendment 7 in Annex 3 of this report.

Agenda Item 7(h) – Review of Chapter 2.1 of the GHS

12. **Subject:** Review of Chapter 2.1 of the GHS

Documents: *None*

Informal documents: *UN/SCETDG/50/INF.11 - UN/SCEGHS/32/INF.8 - (Sweden)*
UN/SCETDG/50/INF.18 - UN/SCEGHS/32/INF.15 - (USA)

Discussion: This is a continuation of the joint effort with the GHS Sub-Committee to amend Chapter 2.1 of the GHS so that it better reflects issues related to the Globally Harmonized System of Classification and Labelling of Chemicals as related to explosive products. An Intersessional Correspondence Group (ICG) has been active during this biennium working on resolution of issues unique to explosive products, and how they can be merged with aspects related to explosives transport in a safe manner without confusion. There was overall strong support for this effort. EWG members discussed a number of important matters to focus on, particularly defining the scope of the effort and the structure of proposals for the system of GHS categories and how they relate to transport divisions. There was strong awareness of the need to progress cautiously to assure that there are not unintended consequences to any sectors.

Conclusion: This effort will continue into the next biennium.

Annex 1

Working Group on Explosives (28 November – 2 December 2016)

List of Participants

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Annex 2

Working Group on Explosives (28 November - 2 December 2016) Changes for the Model Regulations (19th Revised Edition)

Notes: Source of proposed change is indicated by *italicized text* (Source: XXX)

~~Red~~ indicates deleted text

Blue indicates inserted text

Amendment 1.

Section 2.1.1.1(c) – amend 2.1.1.1(c) to remove comma as shown below:

Substances and articles not mentioned under (a) and (b) which are manufactured with a view to producing a practical~~,~~ explosive or pyrotechnic effect.

Source: *ST/SG/AC.10/C.3/2016/53, Para. 8 and Para. 5 of this report.*

Amendment 2.

Section 2.0.4 – amend 2.0.4 by adding 2.0.4.3 as shown below:

2.0.4.3 Samples of energetic materials for testing purposes

2.0.4.3.1 Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.3 in Annex 6 (Screening Procedures) of the Manual of Tests and Criteria may be transported under UN 3224 (solid self-reactive substances) or UN 3223 (liquid self-reactive substances), as applicable, of Division 4.1 provided that:

- (a) The samples do not contain any
- known explosives,
 - substances showing explosive effects in testing,
 - compounds designed with the view of producing a practical explosive or pyrotechnic effect, or
 - components consisting of synthetic precursors of intentional explosives;
- (b) For mixtures, complexes or salts of inorganic oxidizing substances of Division 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:
- Less than 15%, by mass, if assigned to packing group I (high hazard) or II (medium hazard); or
 - Less than 30%, by mass, if assigned to packing group III (low hazard);
- (c) Available data do not allow a more precise classification;
- (d) The sample is not packed together with other goods; and
- (e) The sample is packaged in accordance with special packaging provision PP94 or PP95, as applicable.

Source: *UN/SCETDG/50/INF.23, Para. 4 (as amended by the working group) and Para. 7 of this report.*

Amendment 3.

Chapter 3.2, Dangerous Goods List – Add PP94 and PP95 in Column 9 (Special packing provisions) against the following UN Nos.: 3223 and 3224 as shown below.

UN No.	Name and description	Class or division	Subsidiary risk	UN packing group	Special provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
						(7a)	(7b)	Packing instruction	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
3223	SELF-REACTIVE LIQUID TYPE C	4.1			274	25 ml	E0	P520	PP21 PP94 PP95		
3224	SELF-REACTIVE SOLID TYPE C	4.1			274	100 g	E0	P520	PP21 PP94 PP95		

Source: UN/SCETDG/50/INF.23, Para. 5 (as amended by the working group) and Para. 7 of this report.

Amendment 4.

Chapter 4.14, Packing Instruction P520 – add a new special packing provision PP94 to packing instruction P520 as shown below:

PP94 Very small amounts of energetic samples of section 2.0.4.3 may be carried under UN 3223 or 3224, as appropriate, provided that:

1. Only combination packaging with outer packaging comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are used;
2. The samples are carried in microtiter plates or multi-titer plates made of plastics, glass, porcelain or stoneware as inner packaging;
3. The maximum amount per individual inner cavity does not exceed 0.01 g for solids or 0.01 ml for liquids;
4. The maximum net quantity per outer packaging is 20 g for solids or 20 ml for liquids, or in the case of mixed packaging the sum of grams and millilitres shall not exceed 20; and
5. When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports shall be provided to secure the secondary packaging in the original position. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

Source: UN/SCETDG/50/INF.23, Para. 6 (as amended by the working group) and Para. 7 of this report.

Amendment 5.

Chapter 4.14, Packing Instruction P520 – add a new special packing provision PP95 to packing instruction P520 as shown below:

PP95 Small amounts of energetic samples of section 2.0.4.3 may be carried under UN 3223 or 3224, as applicable, provided that:

1. Outer packaging comprise only type 4G having minimum dimensions of 60 cm (l) by 40.5 cm (w) by 30 cm (h) and minimum wall thickness of 1.3 cm consisting of corrugated fibreboard;
2. The individual substance is contained in an inner packaging of glass or plastics of maximum capacity 30 ml placed in an expandable polyethylene foam matrix of at least 130 mm thickness having a density of 18 +/- 1 g/l;
3. Within the foam carrier, sample receptacles are segregated from each other by a minimum distance of 40 mm and from the wall of the outer package by a minimum distance of 70 mm. The package may contain up to two layers of such foam matrices, each carrying up to 28 sample bottles;
4. The maximum content of each inner receptacle does not exceed 1 g for solids or 1 ml for liquids;
5. The maximum net quantity per outer packaging is 56 g for solids or 56 ml for liquids, or in the case of mixed packaging the sum of grams and millilitres shall not exceed 56; and
6. When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports shall be provided to secure the secondary packaging in the original position. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

Source: UN/SCETDG/50/INF.23, Para. 7 (as amended by the working group) and Para. 7 of this report.

Amendment 6.

List of amendments to Working Document 66 as agreed by the EWG

- | | |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section A
In Chapter 3.2 | <ul style="list-style-type: none">• For UN Number 2067, delete 186 and 306 from column (6) Special provisions;• For UN Number 2071, delete 186 from column (6) Special provisions. |
| Section A
In Chapter 3.3 | <ul style="list-style-type: none">• Change Special provision 193 to read:
"This entry may only be used for ammonium nitrate based compound fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, Part III, Section 39. Fertilizers meeting the criteria for this UN No. <u>Number</u> are only subject to these Regulations when transported by air or sea." |
| Changes to the DGL (table) | Retain 306 in column (6) for UN 2067. |

Source: ST/SG/AC.10/C.3/2016/66 (as amended by the work group) and Para. 8 of this report.

Amendment 7.

Amend Table 1.4.1 to add Class 1, Division 1.6 explosives, at the appropriate location.

Source: UN/SCETDG/50/INF.44 – (UK) (as amended by the work group) and Para. 9 of this report.

Annex 3

Working Group on Explosives (28 November - 2 December 2016)

Changes for the Test Manual (6th Revised Edition)

Notes: Source of proposed change is indicated by *italicized text* (Source: XXX)

~~Red~~ indicates deleted text

Blue indicates inserted text

Amendment 1.

Section 11.5.1.2.2 – amend the fourth sentence of 11.5.1.2.2 as shown below:

Calibration involves heating a tube (fitted with a 1.5 mm orifice plate) filled with 27 cm³ of dibutyl phthalate or silicone oil of apparent density 0.96 ± 0.02 at 20°C and heat capacity 1.46 ± 0.02 J/g.K at 25°C.

Source: *ST/SG/AC.10/C.3/2016/13, Para. 8 (as amended by the working group) and Para.4 of this report.*

Amendment 2.

Section 12.5.1.2.2 – amend the fourth sentence of 12.5.1.2.2 as shown below:

Calibration involves heating a tube (fitted with a 1.5 mm orifice plate) filled with 27 cm³ of dibutyl phthalate or silicone oil of apparent density 0.96 ± 0.02 at 20°C and heat capacity 1.46 ± 0.02 J/g.K at 25°C.

Source: *ST/SG/AC.10/C.3/2016/13, Para. 8 (as amended by the working group) and Para.4 of this report.*

Amendment 3.

Section 18.6.1.2.2 – amend the fourth sentence of 18.6.1.2.2 as shown below:

Calibration involves heating a tube (fitted with a 1.5 mm orifice plate) filled with 27 cm³ of dibutyl phthalate or ~~equivalent~~ silicone oil of apparent density 0.96 ± 0.02 at 20°C and heat capacity 1.46 ± 0.02 J/g.K at 25°C.

Source: *ST/SG/AC.10/C.3/2016/13, Para. 8 (as amended by the working group) and Para.4 of this report.*

Amendment 4.

Section 25.4.1.2.2 – amend the fourth sentence of 25.4.1.2.2 as shown below:

Calibration involves heating a tube (fitted with a 1.5 mm orifice plate) filled with 27 cm³ of dibutyl phthalate or ~~equivalent~~ silicone oil of apparent density 0.96 ± 0.02 at 20°C and heat capacity 1.46 ± 0.02 J/g.K at 25°C.

Source: *ST/SG/AC.10/C.3/2016/13, Para. 8 (as amended by the working group) and Para.4 of this report.*

Amendment 5.

Section 10.3.3 – amend 10.3.3 as shown below:

“10.3.3.2 The acceptance procedure for substances designed to have a practical explosive or pyrotechnic effect starts with the application of test series ~~types 3 (a), 3 (b), 3 (c) and 3 (d)~~ types 3 (a), 3 (b), 3 (c) and 3 (d) to determine if the substance is too sensitive for transport in the form in which it is tested. If the substance passes all tests, the procedure for the assignment to the appropriate division is applied. If the substance fails any of the tests, it is forbidden for transport in the form tested. If it proves to be thermally unstable, i.e. it ~~A substance which fails test type 3 (c) it~~ may be altered and resubmitted to test type 3(c). , it is not permitted to be transported. If it ~~A substance which fails test types 3 (a), 3 (b) or 3 (d) may be encapsulated or packaged to reduce~~

~~sensitiveness to external stimuli and submitted to test type 4(b). it may either be encapsulated or otherwise desensitized or packaged to reduce its sensitiveness to external stimuli. Examples are water wetted primary explosives and primary explosives which have been encapsulated in the form of detonators. The resulting new articles should be submitted to test series 4, and liquids or packaged solids to a test of type 4 (b), to determine whether or not their level of safety in transport is consistent with the requirements of Class 1. Desensitized substances should be re-examined under test series 3 to determine whether their level of safety in transport is consistent with the requirements of Class 1, for the same purpose. If a substance designed to have an explosive effect passes all tests in Test series 3 or an article designed to have an explosive effect passes all tests in series 4, the procedure for assignment to the appropriate division is applied.”~~

Renumber current paragraph 10.3.3.3 to 10.3.3.4.

Renumber current paragraph 10.3.3.4 to 10.3.3.3 and amend as follows:

“10.3.3.3 All articles as presented for transport (packaged or unpackaged) articles containing substances which have failed test type 3 (a), 3 (b) or 3 (d) should be subjected to test series 4. However, if there is sufficient information to indicate that the article would not be too dangerous for transport, the competent authority may decide to waive all or part of these tests for the article. ~~If the article or packaged articles pass test type 4 (a), test type 4 (b) is performed. Encapsulated and/or packaged substances containing substances which have failed test types 3 (a), 3 (b) or 3 (d) are subjected to test type 4 (b) only. If the product fails either test type 4 (a) or 4 (b), it should be rejected. However, the product may be modified and re-tested.~~ If the product passes all the required tests in Test Series test series 4, the procedure for assignment to the appropriate division is applied. If the product fails any of the required tests, it is forbidden for transport in the form tested, but may be modified or repackaged and resubmitted to test series 4. If the competent authority suspects that the product may be subject to stimuli other than those specified in test ~~series type 4 (a) and 4 (b)~~ resulting in potentially dangerous effects, additional information or tests may be required (see note under paragraph 2.1.3.3.1 of the Model Regulations).”

Source: ST/SG/AC.10/C.3/2016/60, Para. 12 (as amended by the working group) and Para. 6 of this report.

Amendment 6. Amend Annex I of document .../C.3/2016/66 as follows:

- 39.3.1 An ammonium nitrate based fertilizer is a ~~fertilizer~~ fertilizer uniform mixture containing ammonium (NH_4^+) and nitrate (NO_3^-) ions. See also 39.3.3.
- 39.3.2 A compound fertilizer is a ~~fertilizer~~ fertilizer uniform mixture that contains at least two of the three primary nutrients nitrogen (N), phosphorus (P) and potassium (K).
- 39.3.4 Combustible substances as referred to in paragraph 39.4 include also ~~non-organic inorganic~~ substances that can be oxidized, e.g. elemental sulphur. For organic substances the content of combustibles is calculated as carbon.
- 39.3.5 Materials that ~~are may be~~ incompatible with ammonium nitrate include ~~e.g.~~ urea, acids, superphosphates with free acid, elemental sulphur, sulphides and most transition metals, including heavy metals (e.g. copper), and chlorides. Note however that this listing is not exhaustive.
- 39.4.2 UN ~~No. Number~~ 2067 may only be used for ammonium nitrate based fertilizers that do not show explosive properties when tested in accordance with Test Series 2 of this Manual.
- 39.4.3 Ammonium nitrate based fertilizers that do not fulfil the requirements for classification as UN ~~No. Number~~ 2067, can be assigned another suitable UN ~~No. Number~~ in Class 1 or Class 5, Division 5.1, provided that the suitability for transport is demonstrated and this is approved by the competent authority. This may for instance be when contamination has occurred in e.g. an accident, so that the

fertilizer can be transported under a suitable UN ~~No.~~ Number e.g. in Class 1 as approved by the competent authority.

- 39.4.8 *Delete the entire paragraph*
 39.5 *Use space between “UN” and “2067” and between “UN” and “2071” throughout the flow chart.*
 39.5 Does it contain any incompatible materials in amounts that could ~~potentially~~ negatively affect the stability of AN? (See 39.3.5 ~~and 39.4.8~~)
 Box D4
 39.5 Not within the composition limits of UN 2067. (See 39.4.3 ~~and 39.4.6~~)
 Box F8
 39.5 Not within the composition limits of UN 2067. (See 39.4.3 ~~and 39.4.6~~)
 Box F36
 39.5 Does it contain ≤80% AN mixed with calcium carbonate and/or dolomite and/or mineral calcium ~~sulfate~~ sulphate?
 Box D38
 39.5 Throughout the flow chart; replace AN with ammonium nitrate and AS with ammonium sulphate

Source: ST/SG/AC.10/C.3/2016/66 (as amended by the work group) and Para. 8 of this report.

Amendment 7.

Amendments to document ST/SG/AC.10/C.3/2016/83 - ST/SG/AC.10/C.4/2016/16 agreed by the Explosives Working Group

Ignore the changes to Sections 1 and 10 (except those listed in Amendment 5), as well as those to Part II and III.

Section 11 Amendments agreed with the following modifications:

11.4.1.2.1 Remove this amendment from the list of amendments and include it in a corrigendum to the 6th revised edition.

11.5.1.3.1 Amend to read as follows:

“In footnote 1, replace “transport conditions” with “operating conditions”

Section 12 Amendments agreed with the following modifications:

12.5.1.3.1 Amend to read as follows:

“In footnote 1, replace “transport conditions” with “operating conditions”

Section 13 Amendments agreed with the following modifications:

13.1 Replace with the following:

“Amend to read as follows:

“This test series is used to answer the questions in boxes 10 and 11 of Figure 10.2 by determining the sensitiveness of the substance to mechanical stimuli (impact and friction), to heat and to flame. The question in box 10 is answered “no” if a “+” is obtained in test type 3(c) and the substance shall be categorised as an unstable explosive; consequentially the substance is not permitted for transport. The question in box 11 is answered “yes” if a “+” is obtained in any of the test types 3(a), 3(b) or 3(d). If a “+” is obtained, the substance shall be categorised as an unstable explosive in the form in which it was tested but may be encapsulated or otherwise desensitized or packaged to reduce its sensitiveness to external stimuli.

***NOTE:** Although explosives categorised as unstable explosives are forbidden for transport they are not prohibited in other sectors where special precautions may be applied.”*

- 13.3.2 Amend to read as follows:
“Replace “wetting agent provided for transport” with “wetting agent specified”.”
- 13.4 Replace with the following:
“Throughout the whole sub-section replace “too dangerous to transport” and “too dangerous for transport” with “an unstable explosive”.
(Applies to the following paragraphs: 13.4.1.1; 13.4.1.4.1; 13.4.1.4.2; 13.4.2.1; 13.4.2.4; 13.4.3.1; 13.4.3.4.1 (twice); 13.4.3.4.2 (twice); 13.4.4.1; 13.4.4.4; 13.4.5.1; 13.4.5.4.2; 13.4.5.4.3; 13.4.6.1; 13.4.6.4.1; 13.4.6.4.2; 13.4.7.1; 13.4.7.5.1 and 13.4.7.5.2)
- 13.4.2.3.1 (c) Replace with the following:
“Replace “are transported” with “are manufactured”.”
- 13.4.6.3.1.1 Replace with the following:
“At the end of the second sentence replace “wetting agent required for transport” with “wetting agent specified”.
- 13.4.7.3.1 Replace with the following:
“At the end of the second sentence replace “wetting agent required for transport” with “wetting agent specified”.
- 13.5 Replace with the following:
“Throughout the whole sub-section replace “too dangerous to transport” and “too dangerous for transport” with “an unstable explosive”.
(Applies to the following paragraphs: 13.5.1.1; 13.5.1.3.4; 13.5.2.1; 13.5.2.4 (twice); 13.5.3.1; 13.5.3.4; 13.5.4.1 and 13.5.4.5)
- 13.5.1.3.1 Replace with the following:
“At the end of the second sentence replace “wetting agent provided for transport” with “wetting agent specified” and in sub-paragraph (c) replace “are transported” with “are manufactured”.
- 13.5.3.3.1 Replace with the following:
“Replace “wetting agent provided for transport” with “wetting agent specified”.”
- 13.5.4.3.1 Replace with the following:
“Replace “wetting agent provided for transport” with “wetting agent specified”.”
- 13.6.1.3.1 Replace with the following:
“Amend the last sentence to read as follows: “If explosion or ignition occurs then the substance is too thermally unstable for transport and shall be categorized as an unstable explosive”.”
- 13.6.1.3.2 Remove this amendment from the list of amendments and include it in a corrigendum to the 6th revised edition.
- 13.6.1.4.2 In the proposed amendment, replace “shall be classified” with “shall be categorised”.
- 13.6.2.4.2 In the proposed amendment, replace “shall be classified” with “shall be categorised”.

- 13.7.1.3 Replace with the following:
“In the last paragraph, replace “too dangerous for transport” with “an unstable explosive”.
- Section 14** Delete all the proposed amendments to this section.
- Section 15** Amendments agreed with the following modifications:
- 15.4.1.3 In the amendment to the fourth last but one sentence, replace “which can be subjected” with “which could be subjected”.
- 15.6.1.1 Replace with the following:
“Replace “packaged as for transport” with “as packaged for transport”.”
- 15.6.1.3.1 Delete the proposed amendment.
- Section 16** Amendments agreed with the following modifications:
- 16.3.1 Delete the amendment to the first sentence.
Replace the amendment to the second sentence with the following: “In the second sentence replace “most disadvantageous” with “most severe”.
(The amendment to the third sentence remains unchanged)
- 16.4.1.3.1 Delete the amendment to the first sentence.
- 16.5.1.3 Delete the amendment to the first sentence.
- 16.6.1.3.1 Delete the proposed amendment.
- 16.7.1.3.1 Replace the amendment with the following: “In the second sentence replace “are to be carried” with “are classified”.”
- Section 17** Delete all amendments except the one addressing paragraph 17.11.1.2.1.
- Section 18** Amendments agreed without modifications.
- Appendix 5** Amendments agreed with the following modification:
- Section 2 At the end of the 7th sentence (“Usually, the bursting pressure...”) do not delete the word “transport” but replace it by “operating” .
- Appendix 6** Amendments agreed with the following modification:
- 2.2 In the amendment relating to the new sentence to be added at the end, replace “during normal operation of transport, storage or use’ with “during normal operating conditions”

Source: ST/SG/AC.10/C.3/2016/83 (as amended by the working group) and Para. 11 of this report.

Annex 4

Working Group on Explosives (28 November - 2 December 2016)

Changes for the GHS Document (6th Revised Edition)

Notes: Source of proposed change is indicated by *italicized text* (Source: XXX)

Red indicates deleted text

Blue indicates inserted text

Amendment 1.

Section 2.1.1.2(c) – amend 2.1.1.2(c) to remove comma as shown below:

Substances, mixtures and articles not mentioned under (a) and (b) above which are manufactured with the view to producing a practical~~,~~ explosive or pyrotechnic effect.

Source: *ST/SG/AC.10/C.3/2016/53, Para. 8 and Para. 5 of this report.*

Amendment 2.

Note b to Table 2.1.1 – amend Note b to Table 2.1.1 to remove comma as shown below:

b This comprises substances, mixtures and articles which are manufactured with a view to producing a practical~~,~~ explosive or pyrotechnic effect.

Source: *ST/SG/AC.10/C.3/2016/53, Para. 8 and Para. 5 of this report.*
