

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

30 June 2022

Sub-Committee of Experts on the Transport of Dangerous Goods

Sixtieth session

Geneva, 27 June-6 July 2022

Item 2 of the provisional agenda

Explosives and related matters

Report of the Working Group on Explosives

Transmitted by the Chair of the Working Group

Introduction

1. The working group met from 27 – 30 June 2022 in a parallel session to the plenary meeting of the Sub-Committee of Experts on the Transport of Dangerous Goods. Due to continuing travel restrictions related to the COVID-19 pandemic, the working group met in a hybrid format with in-person and web conference participation. This meeting of the working group was well attended with 41 experts in attendance from Belgium, Canada, France, Germany, Japan, Netherlands, Poland, South Africa, Spain, Sweden, United Kingdom, United States of America, Australasian Explosives Industry Safety Group (AEISG), Council on Safe Transportation of Hazardous Articles (COSTHA), European Association of Automotive Suppliers (CLEPA), European Chemical Industry Council (Cefic), Institute of Makers of Explosives (IME), Responsible Packaging Management Association of South Africa (RPMASA), and Sporting Arms and Ammunition Manufacturers' Institute (SAAMI). 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 Dr. Joshua Hoffman (IME) as secretariat.

2. Throughout this report, the following abbreviations may be used:

- DGL – Dangerous Goods List
- EWG – Working Group on Explosives
- GHS – Globally Harmonized System
- ICG – Informal Correspondence Group
- MR – Model Regulations
- MTC – Manual of Tests and Criteria
- TDG – Transport of Dangerous Goods

3. As described below, the following documents identified in agenda items 2, 3, 9, 10(c) of the revised provisional agenda for the 60th session¹ were considered for discussion.

Document	Title	Paragraph
<u>Agenda Item 2(a)</u>	<u>Review of Test Series 6</u>	
<i>No Document</i>		
<u>Agenda Item 2(b)</u>	<u>Improvement of Test Series 8</u>	
<i>ST/SG/AC.10/C.3/2022/18 (IME), UN/SCEGHS/60/INF.38 (IME)</i>	Recommendations on Test Series 8: Applicability of Test Series 8 (d)	5

¹ ST/SG/AC.10/C.3/119/Add.1

Document	Title	Paragraph
<u>Agenda Item 2(c)</u>	<u>Review of tests in parts I, II and III of the Manual of Tests and Criteria</u>	
<i>UN/SCETDG/60/INF.5, UN/SCEGHS/42/INF.6 (Cefic)</i>	Manual of Tests and Criteria, sections 1.2.1.4.3 and 20.2.5 on self-heating test N.4 for organic peroxides	6
<i>UN/SCETDG/60/INF.15 (UK, USA)</i>	Parameters for specification of Koenen test apparatus	7
<u>Agenda Item 2(d)</u>	<u>“UN” standard detonators</u>	
<i>No document</i>		
<u>Agenda Item 2(e)</u>	<u>Review of packing instructions for explosives</u>	
<i>No document</i>		
<u>Agenda Item 2(f)</u>	<u>Energetic samples</u>	
<i>No document</i>		
<u>Agenda Item 2(g)</u>	<u>Issues related to the definition of explosives</u>	
<i>ST/SG/AC.10/C.3/2022/36 (COSTHA, SAAMI)</i>	Exit from Class 1 for very low hazard energetic articles	8
<i>UN/SCETDG/60/INF.12 (Sweden)</i>	Issues related to definition of Class 1	9
<u>Agenda Item 2(h)</u>	<u>Review of packaging and transport requirements for ANEs</u>	
<i>No document</i>		
<u>Agenda Item 2(i)</u>	<u>Miscellaneous</u>	
<i>ST/SG/AC.10/C.3/2022/9 (Cefic)</i>	Introduction of a new entry for 5-Trifluoromethyltetrazole, sodium salt (TFMT-Na) in acetone as a desensitized explosive in the Dangerous Goods List of the Model Regulations	10
<i>UN/SCETDG/60/INF.8 (Cefic)</i>	Additional data on proposal ST/SG/AC.10/C.3/2022/9 - 5-Trifluoromethyltetrazole, sodium salt (TFMT-Na) in acetone	10
<i>ST/SG/AC.10/C.3/2022/10 (Cefic), UN/SCETDG/60/INF.16 (Cefic on behalf of WONIPA)</i>	Classification of nitrocellulose membrane filters for diagnostic and other life science applications	11
<i>ST/SG/AC.10/C.3/2022/40 (China)</i>	New special provisions and special packing provisions of UN 2029	12
<i>ST/SG/AC.10/C.3/2022/43 (China)</i>	New UN entry for N- Nitroaminoimidazoline	13
<i>UN/SCETDG/60/INF.10</i>	<i>Classification of fireworks</i>	14
<u>Agenda Item 3</u>	<u>Listing, classification, and packing</u>	
<i>ST/SG/AC.10/C.3/2022/25 (COSTHA)</i>	Fire suppression devices that contain a pyrotechnic material	15
<u>Agenda Item 9</u>	<u>Guiding Principles for the Model Regulations</u>	
<i>ST/SG/AC.10/C.3/2022/39 (Secretariat)</i>	Miscellaneous issues with portable tank instructions and portable tank special provisions	16
<u>Agenda Item 10(c)</u>	<u>Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: Miscellaneous</u>	
<i>ST/SG/AC.10/C.3/2022/11 (Germany, Chairman of EWG)</i>	Amendment of the Manual of Tests and Criteria to appropriately reflect the Globally Harmonized System of Classification and Labelling of Chemicals	17

Document	Title	Paragraph
UN/SCETDG/60/INF.28 (Germany, USA),	Amendments to GHS Chapter 2.17 “Desensitized explosives”	18
UN/SCETDG/60/INF.36 (Germany, USA)	Consequential amendments to INF.8 (GHS) - INF.28 (TDG) (Amendments for desensitized explosives)	19

4. There are two annexes to this report:

- Annex 1 – List of Participants
- Annex 2 – Changes for the Model Regulations (22nd Revised Edition)

Agenda Item 2(b) – Improvements on Test Series 8

5. **Subject.** Recommendations on Test Series 8: Applicability of Test Series 8 (d)

Document: ST/SG/AC.10/C.3/2022/18 (IME)

Informal document: UN/SCEGHS/60/INF.38

Discussion: IME delivered a presentation on 2022/18 and INF.38 which proposes that certain ANEs that satisfy the acceptance criteria of the 8(e) test should not need to be subjected to the 8(d) test and should be considered suitable for containment in portable tanks as oxidizing substances.

The EWG discussed the paper. Belgium pointed out that it appears thermal diffusivity is a critical parameter which governs the behavior of ANE in the referenced simulation, and therefore this parameter should be included to qualify for this waiver. IME commented that UN3375 is guided by SP309, that specifies the components of the ANE and their permitted ranges. However, USA pointed out that SP309 has loose language that may allow other components and exceedance of the respective ranges. Additionally, Belgium notes that it should be stipulated that transport tanks should be unpressurized or relieve at relatively low pressures. The suggestion was made to validate the model by running the model of a Vented Pipe Test (VPT) to explain why that test results in (false) positive tests for the subject ANEs. IME made note of the comments.

RPMASA cited testing which showed that thermal diffusion in the ANEs they tested was higher than assumed. They described the work they recently conducted which was designed with an application point of view. Beginning with small scale testing (Koenen, VPT), they developed larger scale tests mirrored after fast heating of munitions testing standards. Larger scale testing consisted of open topped vertical pipes (5-10m x 27cm), with fuel fire, and run until reaction. RPMASA found the use of small-scale testing can predict onset temperature of a reaction but not the nature of the reaction on a larger scale, with some detonation events purportedly occurring. It was reported that their work suggested a convection effect did take place and the onset temperature took place around 10 minutes in larger scale. It was noted that the EWG had not seen this test data as of the EWG meeting.

Germany questioned if the Minimum Burning Pressure (MBP) test was being conducted consistently around the world. They also commented that the test is not well outlined in the MTC, and a clear methodology should be made. IME responded that CANMET-CERL was the provider of their and many of the explosives companies’ testing apparatus.

Japan stated that they have some questions regarding the modeling work; however, did not elaborate as to the nature of those questions. Further they stated that experimental data should be provided as well.

Spain voiced that they do not envisage approving an ANE without 8(d) testing.

Sweden brought up the conservation of energy and said that modeling of VPT would be a good idea to explain why the 8(d) test gives the results that it does.

USA raised the question regarding the sensitivity of the crust to initiation via tank rupture. It was observed that this would not result in a strong shock. USA stated that validation of the model is necessary and suggested modeling the VPT while varying the energy input.

Conclusion: The EWG supported IME continuing its work. While there were suggestions for additional testing and/or modelling there was no consensus on what that work should be. Transport conditions were initially envisioned by IME's work, however the groups' feedback regarding modelling steered in the direction of the small-scale tests to validate the model and explain the phenomena which drive (false) positive results from the smaller scale tests. IME concluded with a commitment to consider the substantial feedback back before proposing next steps.

Agenda Item 2(c) – Review of tests in parts I, II and III of the Manual of Tests and Criteria

6. **Subject.** Manual of Tests and Criteria, sections 1.2.1.4.3 and 20.2.5 on self-heating test N.4 for organic peroxides (Cefic)

Document: None submitted

Informal document: UN/SCETDG/60/INF.5, UN/SCEGHS/42/INF.6 (Cefic)

Discussion: Cefic introduced their paper which proposes to add organic peroxides in sections 1.2.1.4.3 and 20.2.5 for which no self-heating test N.4 should be conducted.

During the EWG discussion, USA questioned why N series tests would be run on peroxides in the first place, since peroxides give precedence over flammable solids in transport classification. Cefic responded that testing to all hazard class criteria is required by GHS. The EWG discussed the importance of precedence tables and their presence and applicability in the GHS. USA asked whether moving the note from Section 1.2.1 to Section 1.2.2 might be more appropriate since the latter Section is related to GHS classification.

Cefic noted that the same argument made for organic peroxides in these papers could be made for polymerizing substances.

Conclusion: There was a consensus to adopt the proposal; however, it should be reintroduced as a working paper at the next session for formal adoption. In addition, polymerizing substances could be included as well as additional work on physical hazard testing.

7. **Subject.** Parameters for specification of Koenen test apparatus

Document: None submitted

Informal document: UN/SCETDG/60/INF.15 (UK, USA)

Discussion: USA introduced the joint paper which requested a discussion on the unavailability of the sheet steel that meets the original Koenen tube static burst pressure specifications, which rendered the original thickness and mass specifications obsolete. In INF.15, UK and USA put forward a solution which would allow for very minimal variations in tube thickness and mass to accommodate available sheet steel that meets static bursting pressure of 30 ± 3 MPa in MTC Revision 6.

The EWG discussed the paper. USA raised the issue of how changes in testing materials and test specifications, including the broader range and lower limit on the burst pressure specification, have potentially led to different testing outcomes. The group voiced concerns about procurement issues and the quality of available Koenen tubes. The last time the test was amended the change was made

to the burst specification, not the construction specification. IME suggested that if additional substances are tested then testing substances that react beyond 2-10 seconds of beginning the test would be of interest since some substances, such as ANEs, take longer to react in the Koenen test.

Conclusion: The Explosives Working Group was supportive on this work proceeding with round robin tests in which several experts expressed interest in participating.

Agenda Item 2(g) – Issues related to the definition of explosives

8. **Subject.** Exit from Class 1 for very low hazard energetic articles

Document: ST/SG/AC.10/C.3/2022/36 (COSTHA, SAAMI)

Informal document: None submitted

Discussion: SAAMI introduced 2022/36 which continued the discussion from previous sessions surrounding the proposal of creating a scientific and conservative method to reclassify very low hazard articles containing minute amounts of explosive substances.

During the discussion, Sweden noted that this issue is symptomatic of limitations with the current definition of explosives. Further, while technical experts know the difference between 1.1, 1.2, 1.3, 1.4S etc., the public does not, including some authorities having jurisdiction over transportation in general. SAAMI stated that a systematic regime for evaluating all products is necessary so that products are not evaluated in isolation and inconsistently across various jurisdiction. Sweden voiced concern as to when products are excluded from Class 1, and not otherwise regulated, then there may remain security concerns even though there may not be any hazard concerns. Sweden noted that the lowest hazard is 1.4S with the next step exclusion from Class 1 and therefore there should be another tier before exit.

USA questioned if there is a gap between the current class 1 divisions and exclusions. They further questioned if the problem is a classification issue or a post-classification perception issue and if the latter is the case distinct hazard communication elements may alleviate this. SAAMI explained that there is an inequity in application of controls compared to other dangerous goods. They also responded to ease of transport and that it may not be an issue in some countries or modes, but this is not a global reality and the MR speak to the global community. In response to a comment from AEISG, SAAMI noted that these products would be retained within GHS class of explosives. COSTHA voiced that there is a gap especially for life-safety products that fail the noise requirement. USA noted that work should be focused on the article itself rather than as packaged.

Conclusion: The EWG supported SAAMI continuing exploratory work to inform future discussions regarding the potential differentiation of hazards from articles currently in division 1.4S. This may include alternative designations based upon yet to be determined criteria.

9. **Subject.** Issues related to definition of Class 1

Document: UN/SCETDG/60/INF.12 (Sweden)

Informal document: None submitted

Discussion: Sweden introduced INF.12 which discussed incongruences between the definition of Class 1 in MR 2.1.1.1 and the MTC and recommended amendments. A presentation was used to lead the discussion and was later shared with the group.

COSTHA noted that the definitions should allow for differing technologies, configurations, and substances.

UK expressed the opinion that this work has highlighted the potential tensions between policy needs and the application of strict criteria. The MTC has no enforcement ability unless referenced directly

in regulation. The fact that goods have been placed outside of Class 1 has sometimes been based on considerations other than the purely technical and a rigid matrix might not always be appropriate as this flexibility is warranted. Any change to the definition would require legal guidance. Explanation of why the differences exist might be a better course of action than amending the definition. The topic of thermites and how they are treated was raised with the suggestion that the EWG should broach the topic at some time.

USA voiced that additional guidance on “predominant hazard is appropriate to another class” might be helpful and stated this might occur by mutual agreement of the Sub-Committee with provisions in the DGL.

Germany did not support changing the definition due to how widely it is used/incorporated around the world and supported explanation of the differences between the definition and the testing regime.

The Netherlands was reluctant to change the definitions due to the ramifications.

SAAMI suggested that amending the classification logic may be a path forward to supplement the definition.

There was general conversation about how pyrotechnic substances are a subset of explosive not a distinct substance.

Conclusion: The EWG concluded that the work of Sweden has identified genuine issues in inconsistencies that will require additional work, specifically, Proposal 1. The EWG did not support Proposal 1, however developing explanations and guidance in the MR to explain the inconsistencies should be pursued.

The EWG considered Proposals 2 and 3 and suggested some amendments to both. Proposals 2 and 3, as amended, were approved by the EWG. Both amendments are placed in [] to be removed next session unless determined otherwise. See Annex 2, Amendment 3.

In accepting the amended Proposals 2 and 3, the EWG agreed that quantities of pyrotechnic substances should be taken into account in the calculation of the net explosive mass.

Agenda Item 2(i) – Miscellaneous

10. **Subject.** Introduction of a new entry for 5-Trifluoromethyltetrazole, sodium salt (TFMT-Na) in acetone as a desensitized explosive in the Dangerous Goods List of the Model Regulations

Document: ST/SG/AC.10/C.3/2022/9 (Cefic)

Informal document: UN/SCETDG/60/INF.8 (Cefic)

Discussion: Cefic introduced their papers which propose a new entry for TFMT-Na, an amendment to SP28, and a new relevant packing instruction. The test data submitted support that TFMT-Na, when in a 32% solution of acetone, should be classified as a desensitized explosive.

The group agreed that that MR do not contain any provisions for transport of samples (small quantities) of desensitized explosives. This should be addressed as its own issue.

USA questioned why SP28 was assigned only to 4.1 entries and if a new SP for Class 3 is more appropriate than modifying SP28 or if any SP is necessitated by TFMT-Na in acetone. USA also noted that the packaging instructions should handle any issues relating to loss of solvent rather than relying on SP132.

The question was raised whether there should also be a UN entry for the TFMT-Na dry so that authorities know what the material is without acetone in case of a spill. Cefic responded that the material could be easily dissolved in water in such a situation.

SP266 was also questioned for appropriateness and Cefic agreed to its removal from the proposal.

After consulting experts on packaging, it was determined that Packing Group 2, and SP28 and SP132 were appropriate and will be included.

Conclusion: The working group agreed with the proposals in 2022/9 as amended. See Annex 2, Amendment 1.

In addition, based on the discussion, the EWG supported future discussions on whether other liquid desensitized explosives entries in class 3 could be harmonized with respect to SP28. Cefic will prepare a proposal to address this. Further, the group noted that MR are missing packing group(s) for samples (small quantities) of desensitized explosives.

A paper will be prepared for other entries that utilize SP28 to determine if the application is appropriate and consistent.

11. **Subject.** Classification of nitrocellulose membrane filters for diagnostic and other life science applications

Document: ST/SG/AC.10/C.3/2022/10 (Cefic on behalf of WONIPA)

Informal document: UN/SCETDG/60/INF.16 (Cefic on behalf of WONIPA)

Discussion: Cefic introduced their papers which reported final testing results to support an anticipated proposal for a special provision for a clearly defined group of Nitrocellulose (NC) membrane filters, which could be excluded from the division 4.1 flammable solids.

USA and UK both questioned why the NC content value of 55 g/m² was proposed when 53 g/m² passed, and 60 g/m² failed the card gap test. Cefic agreed that a value of 53 g/m² NC content would be acceptable.

UK questioned if the burning rate test predicts the behavior of the filters when packed. USA questioned the same and noted that the packaging requirements will have to be clearly derived and strictly adhered. Cefic noted that the burning rate test was conducted without the overpacks but rather the filters with the paper dividers in between the filters but indicated that these additional packing layers would slow the burn rate. The working group made edits to the proposed packing instructions.

UK indicated it would like to see some larger scale tests with the entirety of the packaging. USA noted that the critical elements of the packaging as tested are to be used by those using this Special Provision.

The group discussed a few options for additional testing. COSTHA suggested testing one box in the 6(c) test and observe if additional energetic contribution is made by the packaged nitrocellulose. If no additional contribution, then there would be confidence in the smaller scale testing. USA suggested a single box with a burner from the side. Cefic noted that such a test has been done on the rolls of NC filter. Delegates were interested in seeing results from each packaging configuration subjected to single burner tests.

Conclusion: The working group unanimously recommended to accept the proposal as amended. See Annex 2, Amendment 2. Cefic accepted the limit of NC content of 53 g/m², which is covered by a test result. The EWG would like to see how the product behaves in packaging. Additional single package testing will be made by Cefic using inner packaging configurations subjected to a burner that is used for airbags. A specification or specific language for tightly packed will be made in the proposed special provision.

12. **Subject.** New special provisions and special packing provisions of UN 2029

Document: ST/SG/AC.10/C.3/2022/40 (China)

Informal document: None Submitted

Discussion: No delegate from China was present to introduce the paper which proposes to amend the entry for UN 2029 (hydrazine anhydrous) in 3.2 DGL by adding Special Provision 132, a new Special Provision XXX and Special Packing Provision PP5.

During the EWG discussion, Sweden noted that the substance has both intentional and unintentional explosives effects applications.

Cefic noted that hydrazine hydrate (64% mixture with water) is the most common form found in industry. The working group discussed the various applications for hydrazine anhydrous.

Germany voiced that, even though it is an explosive precursor, given the testing data presented in the paper, there exists reason to consider hydrazine anhydrous as Class 1 pending additional testing.

UK noted that the special provision needs work and may be simplified. The group discussed existing special provisions (e.g., SP133, SP181) that may be better suited.

The group discussed how this substance would be evaluated if it were a new substance even though this substance has been used for a long time. There was a desire to see additional testing data for self-reactivity and explosive properties.

Sweden noted the options of conducting full testing for explosive or self-reactive properties or to leave it as is and add a SP or Packing instruction that prevents the conditions which would cause explosivity.

Conclusion: In principle, the group supports a warning about the potential explosivity in confinement, however did not agree that the language proposed in SPXXX adequately addresses this hazard. The SPXXX proposed needs amendment before the working group would recommend to accept it.

The group raised many questions on proper classification, packaging requirements and desires more information on toxicity and quantities utilized worldwide. The working group suggests that China conduct testing for self-reactivity and based on results also Class 1.

13. **Subject.** New UN entry for N- Nitroaminoimidazoline

Document: ST/SG/AC.10/C.3/2022/43 (China)

Informal document: None submitted

Discussion: No delegate from China was present to introduce the paper which proposes new assignment of a UN number and a proper shipping name to N-Nitroaminoimidazoline.

The EWG discussed the paper. Sweden noted that the use of the substance is not intended for use as an explosive and seeing the case presented in the paper agreed that Class 5.1 is appropriate.

Netherlands noted an apparent discrepancy between the images of the burning tests and the thermal data provided and this was discussed by the group.

It was also noted that the substance was tested in paper bags and may have a different result in other packaging.

Conclusion: The working group did not support the proposal at this time but would welcome additional, data and information including confirmation of the heat flux with direct measurement (heat gauges), and information on the incident referred to in the working paper.

14. **Subject.** Classification of fireworks

Document: None submitted

Informal document: UN/SCETDG/60/INF.10 (Netherlands)

Discussion: In INF.10, the Netherlands discussed the results of recent testing on samples of consumer fireworks to verify they are compliant with their national law that stipulates that “consumer fireworks shall be packed in such a way that a 1.4 classification can be assigned”. TNO performs UN 6(c) tests twice a year on samples taken by the Human Environment and Transport Inspectorate. Up to 2020 an average failure rate of 30 – 40% of the samples has been found. Videos of failures were shown and discussed.

Poland noted that they have had similar experiences in their testing of similar products.

The group discussed flash powders and how stars and whistle compositions can perform very energetically. The group discussed this in light of the current default table and saw a need for further discussion since composition and performance of fireworks have changed since the adoption of the default table.

Germany shared a presentation on the same topic. Test results were shown from testing with and without metal cage packaging around the fireworks. Germany will conduct further tests with modified cage configuration and investigate the relevance of the arrangement of the packages during 6(c) test. A comparison between Dutch and German result shows that this fact has to be considered. It was noted that the description of the test setup in the MTC does not take into account this element.

The group also exchanged experiences on the quality of the manufacturers’ technical documentation, which often does not match the real product.

Conclusion: The EWG agreed that the following topics should be discussed in future meetings:

- A review of the default table given the new and novel compositions being encountered on the fireworks market
- The clarification in description of the 6(c) test regarding the arrangement of packages, witness panels and 0.15 m³ requirement
- Ideas for building confidence in the technical documentation

Agenda Item 3 – Listing, classification and packing

15. **Subject.** Fire suppression devices that contain a pyrotechnic material

Document: ST/SG/AC.10/C.3/2022/25 (COSTHA)

Informal document: UN/SCETDG/60/INF.33 (COSTHA)

Discussion: COSTHA introduced their paper which proposes that a new entry be added to the DGL for fire suppression dispersing devices. COSTHA explained that competent authorities around the world have approved the devices in question in various classes.

The EWG discussed the paper.

USA noted the asphyxiation aspect and requested details on how a product is qualified for use in occupied space vs. unoccupied space.

UK noted that standards for byproducts of combustion and their toxicity are not as robustly defined as other explosive hazards. They also noted that recognition of secondary hazards should be made. COSTHA reviewed the testing they performed which was submitted to the EPA regarding live animal testing to the suppression agent.

USA did not agree that waiving select criteria in exclusion tests was appropriate. USA would support the 1.4S entry but there would need to be further discussion before supporting Class 9.

USA (FAA) questioned if the argument to accept the firefighting aspects of the devices for consideration is valid and inquired if there were any qualifiers or testing to be done to substantiate the claim. COSTHA responded that perhaps an upper-mass limit of the explosive would satisfy that concern.

The concept was introduced that, for a device to qualify into Class 9, it would have to be approved for occupied spaces.

Belgium agreed with the new entry but not with the proposed criteria for exclusion from Class 1 and noted that modification of the design of the articles would make it possible to satisfy the criteria from Paragraph 2.1.3.6.4 of the MR.

The group discussed the different technologies in question, those that the extinguishing agent is derived from an energetic substance, and those where the energetic substance disperses a fire suppressant which is not an energetic material.

Canada supports a Class 1 entry with a specific UN number and definition for the items, and that the existing exclusion tests are appropriate to exit Class 1. Canada indicated that instead of waiving exclusion tests, alternative criteria could be considered for these products.

Conclusion: The EWG could not reach agreement on COSTHA's proposal at this time but supported continued work and discussion including working on a definition for technologies to which this new entry would apply. There was recognition of the utility of the devices and support for a solution to the lack of harmonized classification for global transport as described in the papers. COSTHA committed to take the feedback received and introduce a new paper at the next session.

Agenda Item 9 – Guiding Principles for the Model Regulations

16. **Subject.** Miscellaneous issues with portable tank instructions and portable tank special provisions

Document: ST/SG/AC.10/C.3/2022/39 (Secretariat)

Informal document: None submitted

Discussion: During the final editing of the latest version of the guiding principles, the secretariat introduced a mistake in section C.3 containing the guidelines for assigning portable tank special provisions to individual substances. In the process of correcting that mistake, the secretariat took the opportunity to review the guidelines in section C.3, which lead to spotting a few other issues. The EWG reviewed the assignment of TP1 to UN 0331.

This paper was discussed at the recent IGUS/EPP & CIE meeting and IME was asked to advise if there is a need for the assignment of TP1 to UN 0331. IME reported that its members only use UN 0331 for ANFO.

Conclusion: UN 0331 (EXPLOSIVE, BLASTING, TYPE B) was found to be used for ANFO and therefore there is no need for the degree of filling requirement stipulated by TP1. The work group does not believe there is the need for the assignment of TP1 to UN 0331.

Agenda Item 10 (c) – Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: Miscellaneous

17. **Subject.** Amendment of the Manual of Tests and Criteria to appropriately reflect the Globally Harmonized System of Classification and Labelling of Chemicals

Document: ST/SG/AC.10/C.3/2022/11 (Germany, Chairman of EWG)

Informal document:

Discussion: As reported in 2022/11, the experts from Germany and the Chairman did a further review of the MTC to identify (all) references in the Manual to worker protection/safety of testing personnel. In doing that, two places were found where amendments are necessary to correctly reflect the GHS in the Manual. The EWG discussed the merits of the proposal.

Conclusion: The EWG supported the amendments with the preference of Option 1 in Proposal 2.

18. **Subject.** Amendments to GHS Chapter 2.17 “Desensitized explosives”

Document: None

Informal document: UN/SCETDG/60/INF.28, UN/SCETDG/60/INF.36 (Germany, USA)

Discussion: In INF.36, Germany continued the discussion from the previous Session of proposed amendments to Chapter 2.17 “Desensitized explosives.”

The working group walked through the logic of the amendments and their effects.

UK noted their general support to the amendments.

Cefic noted a mistake in the decision logic in Figure: *Decision logic 2.17.1 for desensitized explosives* in INF36. Germany agreed that it was an error and agreed to make a correction.

USA questioned whether the compatibility of ingredients in a mixture containing nitrocellulose needs to be assessed by thermal stability tests, if the nitrocellulose itself previously met Appendix 10 requirements. Cefic/WONIPA clarified that the test is done on the nitrocellulose prior to its addition to a mixture, and based on experience there are no known stability problems with these mixtures where NC is the only energetic ingredient.

Conclusion:

The EWG supported the proposals in INF.28 and INF.36 however there were three amendments to be reflected in the proposal before GHS plenary. In INF 28 discussion of 2.17.2.3 was amended to read “In addition to the criteria in sections 2.17.2.1 and 2.17.2.2, nitrocellulose **should be stable according to Appendix 10 of the MTC in order to be used** in nitrocellulose mixtures considered for this class” to clarify that the testing of the nitrocellulose should be tested prior to be used in the mixture.

In decision logic 2.17.1 in Annex I of document UN/SCEGHS/42/INF.18-UN/SCETDG/60/INF.36 a correction is necessary. In the box for nitrocellulose, the word “stable” should be replaced by the word “unstable” the error in the flow chart noted above. In Annex II of the document in INF 36, in 51.2.2, the sub paragraph(d) was removed and combined with paragraph (c). Germany plans to report to the GHS during its 42nd Session.

Annex 1

Working Group on Explosives (27 - 30 June 2022)

List of Participants²

Name	Representing	Email address *
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² It is recognized that some experts only participated in part(s) of the session.

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Annex 2

Working Group on Explosives (27 – 30 June 2022)

Changes for the Model Regulations (22nd Revised Edition)

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

Unless otherwise indicated, ~~Red~~ indicates deleted text

Unless otherwise indicated, Blue indicates inserted text

Amendment 1.

A. In 3.2.2 Dangerous Goods List create an entry as follows:

UN No.	Name and description	Class or division	Subsidiary hazard	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)
XX	TRIFLUOROMETHYLTHYL-TETRAZOLE-SODIUM SALT IN ACETONE, with not less than 68 % acetone, by mass	3		I <u>II</u>	28, 132, 266	0	E0	PYYY	PP26		

B. In 2.3.1.4 amend the last sentence to read as follows (new text in underlined and deleted text in strike through):

“Entries in the Dangerous Goods List for liquid desensitized explosives are: UN 1204, UN 2059, UN 3064, UN 3343, UN 3357, and UN 3379 and UN XX.”

C. In 3.3.1 amend special provision 28 to read as follows (new text in underlined):

“This substance may be transported under the provisions of Class 3 or Division 4.1, only if it is so packed that the percentage of diluent will not fall below that stated, at any time during transport (see 2.3.1.4 and 2.4.2.4).”

D. In 4.1.4.1 create a new packing instruction PYYY as follows:

PYYY	PACKING INSTRUCTION	PYYY
This instruction applies to UN No. XX		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 as well as 4.1.5.12 are met:		
<p>(+) Plastics drum non-removeable head (1H1) of maximum capacity 250 litres</p> <p>(2) — Combination packagings</p> <p>— Outer packagings: 4C2, 4D, 4F, 4Ga, 4H1, 4H2 with a maximum content of 2 litres</p> <p>— Inner packagings: glass inner packagings with a maximum net content of 1 litre cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents.</p> <p>a — Packagings shall be leakproof</p>		
Additional requirements:		
Packagings shall be designed and constructed to prevent the loss of the content of the phlegmatizer.		

The packagings shall be transported in an upright position.
Special packing provisions:
PP26 For UN No. XX packagings shall be lead free.

Source: ST/SG/AC.10/C.3/2022/9 paras. 15 – 18 as amended and para. 10 of this report.

Amendment 2.

A. Add the following special provision to the chapter 3.3.1 of the UN Model Regulations:

SPXXX Nitrocellulose (NC) membrane filters covered by this entry with NC content not exceeding 53 g/m² and a NC net weight not exceeding 300 g per inner packaging, are not subject to the requirements of this regulation if they meet the following conditions:

(a) They are packed with paper separators of minimum 80 g/m² placed between each layer of NC membrane filters

(b) They are packed in order to maintain the alignment of the NC membrane filters and the paper separators in any of the following configurations:

(i) Rolls tightly wound and packed in plastic foil of min. 80 g/m² or aluminium pouches with an oxygen permeability of equal or less than 0.1 % according to ISO 15505.

(ii) Sheets packed in cardboard of min. 250 g/m² or aluminium pouches with an oxygen permeability of equal or less than 0.1 % according to ISO 15505.

(iii) Round filters packed in disc holders or cardboard packaging of min. 250 g/m² or single packed in pouches of paper and plastic material of total min. 100 g/m².

B. Add SPXXX to the DANGEROUS GOODS LIST in chapter 3.2 of the UN Model Regulations in Column 6 of the UN No. 3270 NITROCELLULOSE MEMBRANE FILTERS, with not more than 12.6 % Nitrogen, by dry mass.

Source: UN/SCETDG/60/INF.16 paras. 17 – 18 as amended and para. 11 of this report.

Amendment 3.

A. Amend the term “pyrotechnic substance” in 2.1.1.3 to read:

[Pyrotechnic substance is an explosive substance that is ~~a substance or a mixture of substances~~ designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.]

B. Add a definition of “explosive or pyrotechnic effect” in 2.1.1.3 as point (e) to read as follows:

[Explosive or pyrotechnic effect in the context of 2.1.1.1 c) means an effect produced by self-sustaining exothermic chemical reactions including shock, blast, fragmentation, projection, heat, light, sound, gas and smoke. ~~Pyrotechnic effect is a kind of explosive effect.~~]

Source: UN/SCETDG/60/INF.12 paras. 32 – 33 as amended and para. 9 of this report.