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### Economic Commission for Europe

#### Inland Transport Committee

#### Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)

#### Thirty-second session

Geneva, 22-26 January 2018

Item 5 (a) of the provisional agenda

**Proposals for amendments to the Regulations annexed to ADN: work of the RID/ADR/ADN Joint Meeting**

### **Draft amendments to ADN proposed by the Ad Hoc Working Group on the Harmonization of RID/ADR/ADN with the United Nations Recommendations on the Transport of Dangerous Goods and modified by the Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods**

#### Note by the secretariat<sup>\*,\*\*</sup>

1. The report of the Ad Hoc Working Group on the Harmonization of RID/ADR/ADN with the United Nations Recommendations on the Transport of Dangerous Goods can be found in document ECE/TRANS/WP.15/AC.1/2017/26.
2. The draft amendments proposed by the Ad Hoc Working Group (ECE/TRANS/WP.15/AC.1/2017/26/Add.1) were considered by the Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods at its autumn session in 2017 (Geneva, 19–29 September 2017) and the Joint Meeting proposed modifications that can be found in ECE/TRANS/WP.15/AC.1/148/Add.1).

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\* Distributed in German by the Central Commission for the Navigation of the Rhine in document CCNR-ZKR/ADN/WP.15/AC.2/2018/1.

\*\* In accordance with the programme of work of the Inland Transport Committee for 2017-2018 (ECE/TRANS/WP.15/237, annex V (9.3.)).

3. The proposed amendments as modified by the Joint Meeting that could be considered relevant for ADN can be found below.

## Chapter 1.1

1.1.3.1 (b) Delete and insert “(b) *(Deleted)*”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.1.3.5 The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.1.4.2.1 In the first sentence and in (c), after “containers,” insert “bulk-containers.”

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Chapter 1.2

1.2.1 In the definition of “*Animal material*”, replace “or animal foodstuffs” by “foodstuffs or feedstuffs derived from animals”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.2.1 In the definition of “*Control temperature*”, replace “or the self-reactive substance” by “, the self-reactive substance or the polymerizing substance”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.2.1 In the definition of “*GHS*”, replace “sixth” by “seventh” and replace “ST/SG/AC.10/30/Rev.6” by “ST/SG/AC.10/30/Rev.7”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.2.1 In the definition of “*Manual of Tests and Criteria*”, after “ST/SG/AC.10/11/Rev.6”, insert “and Amend.1”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Chapter 1.6

1.6.1.43 Replace “240, 385 and 669” by “388 and 669”. Replace “the requirement of 2.2.9.1.7” by “the provisions of 2.2.9.1.7”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.6.1 Add the following new transitional measure:

“1.6.1.46 The carriage of machinery or equipment not specified in this annex and which happen to contain dangerous goods in their internal or operational equipment and which are therefore assigned to UN Nos. 3363, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 or 3548, which was exempted from the provisions of ~~ADR~~ ADN according to 1.1.3.1 (b) applicable until 31 December 2018, may continue to be exempted from the provisions of ~~ADR~~ ADN until 31 December 2022 provided that measures have been taken to prevent any leakage of contents in normal conditions of carriage.”

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)*

## Chapter 1.7

1.7.1.1 The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.7.1.2 The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.7.5 In the first sentence, replace “subsidiary risk” by “subsidiary hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Chapter 1.10

1.10.3 After the heading, insert the following note:

**“NOTE:** *In addition to the security provisions of ADRADN, competent authorities may implement further security provisions for reasons other than safety during carriage (see also Article 4, paragraph 1 of the Agreement). In order to not impede international and multimodal carriage by different explosives security marks, it is recommended that such marks be formatted consistent with an internationally harmonized standard (e.g. European Union Commission Directive 2008/43/EC).”*

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

1.10.3.1.5 Replace “subsidiary risk” by “subsidiary hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Chapter 2.1

2.1.2.1 In the last sentence, replace “subsidiary risk(s)” by “subsidiary hazard(s)” and replace “those risks” by “those hazards”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.2.5 In the second and in the third sentence, replace “subsidiary risk” by “subsidiary hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.2.8 The amendment to the first indent does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.2.8 In the second indent, replace “subsidiary risk(s)” by “subsidiary hazard(s)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.3.3 In the last paragraph, replace “subsidiary risks” by “subsidiary hazards”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.3.7 In the first sentence, replace “subsidiary risk” by “subsidiary hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.1.3.7 At the end, add: “For solid ammonium nitrate based fertilizers, see also 2.2.51.2.2, thirteenth and fourteenth indent and Manual of Tests and Criteria, Part III, Section 39.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 annex, as amended by ECE/TRANS/WP.15/AC.1/148)

2.1.4 Add the following new sub-section 2.1.4.3:

**“2.1.4.3 Samples of energetic materials for testing purposes**

2.1.4.3.1 Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.3 in Appendix 6 (Screening Procedures) of the Manual of Tests and Criteria may be carried under UN No. 3224 (self-reactive solid type C) or UN No. 3223 (self-reactive liquid type C), as applicable, of Class 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 Class 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 packed in accordance with packing instruction P520 and special packing provisions PP94 or PP95 of 4.1.4.1 of ADR, as applicable.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)

2.1.5 Add the following new section 2.1.5 and renumber existing 2.1.5 as 2.1.6:

**“2.1.5 Classification of articles as articles containing dangerous goods, n.o.s.**

**NOTE 1:** For articles which do not have an existing proper shipping name and which contain only dangerous goods within the permitted limited quantity amounts specified in Column (7a) of Table A of Chapter 3.2, see UN No. 3363 and special provisions 301 and 672 of Chapter 3.3.

**[NOTE 2:** The term “existing proper shipping name” in NOTE 1 above excludes specific n.o.s. entries for UN Nos. 3537 to 3548.]

2.1.5.1 Articles containing dangerous goods may be classified as otherwise provided by ~~ADR-ADN~~ under the proper shipping name for the dangerous goods they contain or in accordance with this section.

For the purposes of this section “article” means machinery, apparatus or other devices containing one or more dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning and that cannot be removed for the purpose of carriage.

An inner packaging shall not be an article.

2.1.5.2 Such articles may in addition contain batteries. Lithium batteries that are integral to the article shall be of a type proven to meet the testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3, except when otherwise specified by ~~ADR-ADN~~ (e.g. for pre-production prototype articles containing lithium batteries or for a small production run, consisting of not more than 100 such articles).

2.1.5.3 This section does not apply to articles for which a more specific proper shipping name already exists in Table A of Chapter 3.2.

2.1.5.4 This section does not apply to dangerous goods of Class 1, Class 6.2, Class 7 or radioactive material contained in articles.

2.1.5.5 Articles containing dangerous goods shall be assigned to the appropriate Class determined by the hazards present using, where applicable, the table of precedence of hazard in 2.1.3.10 for each of the dangerous goods contained in the article. If dangerous goods classified as Class 9 are contained within the article, all other dangerous goods present in the article shall be considered to present a higher hazard.

2.1.5.6 Subsidiary hazards shall be representative of the primary hazards posed by the other dangerous goods contained within the article. When only one item of dangerous goods is present in the article, the subsidiary hazard(s), if any, shall be the subsidiary hazard(s) identified by the subsidiary hazard label(s) in column (5) of Table A of Chapter 3.2. If the article contains more than one item of dangerous goods and these could react dangerously with one another during carriage, each of the dangerous goods shall be enclosed separately (see 4.1.1.6 ~~of ADR~~).”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)*

## Chapter 2.2

2.2.1.1.1 (c) Replace “practical effect by explosion or a pyrotechnic effect” by “practical explosive or pyrotechnic effect”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.5 For “Division 1.4”, in the first sentence, replace “risk” by “hazard”. For “Division 1.6”, in the Note, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.6 For “Compatibility group L”, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.7.1 (a) Replace “giving a positive result when tested in one of the HSL Flash composition tests in Appendix 7 of the Manual of Tests and Criteria” by “containing flash composition (see Note 2 of 2.2.1.1.7.5)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.7.5 Amend Note 2 to read as follows:

**“NOTE 2:** “Flash composition” in this table refers to pyrotechnic substances in powder form or as pyrotechnic units as presented in the fireworks that are used in waterfalls, or to produce an aural effect or used as a bursting charge, or propellant charge unless:

- (a) The time taken for the pressure rise in the HSL Flash Composition Test in Appendix 7 of the Manual of Tests and Criteria is demonstrated to be more than 6 ms for 0.5 g of pyrotechnic substance; or

(b) *The pyrotechnic substance gives a negative “-” result in the US Flash Composition Test in Appendix 7 of the Manual of Tests and Criteria.”.*

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.7.5 (table) The first amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.7.5 (table) Amend the entry for “Waterfall” as follows:

For classification 1.1G, amend the entry under “Specification” to read: “Containing flash composition regardless of the results of Test Series 6 (see 2.2.1.1.7.1 (a))”.

For classification 1.3G, amend the entry under “Specification” to read: “Not containing flash composition”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.1.8.2 In Note 2, at the end, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.1.4 The amendments do not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.2.1.5 Under “Toxic gases”, in the Note, replace “risk” by “hazard”. Under “Corrosive gases”, in the first and second sentences, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.2.3 (table) Under “Other articles containing gas under pressure”, for “6A”, add “3538 ARTICLES CONTAINING NON-FLAMMABLE, NON TOXIC GAS, N.O.S.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.2.3 (table) Under “Other articles containing gas under pressure”, for “6F”, add “3537 ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.2.3 (table) Under “Other articles containing gas under pressure”, add a new row as follows:

6T	3539 ARTICLES CONTAINING TOXIC GAS, N.O.S.
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*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.3.1.2 For “Subdivision F”, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.3.1.3 In the last paragraph, replace “risk(s)” by “hazard(s)” (twice).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.3.1.6 Replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.3.3 For “F”, replace “risk” by “hazard”. For “FT2”, in the Note after the entries, replace “risks” by “hazards”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.3.3, List of collective entries In “Flammable liquids and articles containing such substances”, for “F3”, add:

“3540 ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.2 In “F”, replace “risk” by “hazard”. In “D”, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.7 Replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.12 At the end of the first paragraph, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.17 Amend to read as follows:

“2.2.41.1.17 Self-reactive substances with an SADT not greater than 55 °C shall be subject to temperature control during carriage. See 7.1.7.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.21 At the end, add the following: “See 7.1.7.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.1.21 Add the following Note at the end:

**“NOTE:** Substances meeting the criteria of polymerizing substances and also for inclusion in Classes 1 to 8 are subject to the requirements of special provision 386 of Chapter 3.3.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.3, List of collective entries In “Flammable solids” and in “Solid desensitized explosives”, replace “without subsidiary risk” by “without subsidiary hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.3, List of collective entries In “Flammable solids”, for “F4”, add:

“3541 ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.4 At the end of the first paragraph, replace “4.2.5.2” by “4.2.5.2.6” and add a new sentence to read as follows: “The formulations listed in packing instruction IBC520 of 4.1.4.2 of ADR and in portable tank instruction T23 of 4.2.5.2.6 of ADR may also be carried packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1 of ADR, with the same control and emergency temperatures, if applicable.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.4 In the table, insert a new entry to read as follows:

<i>SELF-REACTIVE SUBSTANCE</i>	<i>Concentration (%)</i>	<i>Packing method</i>	<i>Control temperature (°C)</i>	<i>Emergency temperature (°C)</i>	<i>UN generic entry</i>	<i>Remarks</i>
Phosphorothioic acid, O-[(cyanophenyl methylene) azanyl] O,O-diethyl ester	82-91 (Z isomer)	OP8			3227	(10)

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.4 After the table, in remarks (1), (4), (6), replace “2.2.41.1.17” by “7.1.7.3.1 to 7.1.7.3.6”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.4 In remark (2) after the table, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.41.4 After the table, add a new remark (10) to read as follows:

“(10) This entry applies to the technical mixture in n-butanol within the specified concentration limits of the (Z) isomer.”

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.1.2 Amend the title of subdivision “S” to read “Substances liable to spontaneous combustion, without subsidiary hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.1.2 In “S Substances liable to spontaneous combustion, without subsidiary hazard”, insert the following new entry: “S6 Articles”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.1.5 In Note 3, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.1.6 Replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.3, List of collective entries In “S”, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.42.3, List of collective entries In “S Substances liable to spontaneous combustion, without subsidiary hazard”, insert the following new entry:

Articles	S6	3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.
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(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.43.1.2 In the title of subdivision “W” replace “without subsidiary risk” by “without subsidiary hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)



2.2.43.1.5 In the Note, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.43.1.6 Replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.43.3, List of collective entries In the “W”, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.43.3, List of collective entries In “Substances which, in contact with water, emit flammable gases, without subsidiary hazard”, for “articles W3”, add the following new entry:

“3543 ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.1.2 In the title of subdivision “O” replace “without subsidiary risk” by “without subsidiary hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.1.3 and 2.2.51.1.5 Replace “2.2.51.1.9” by “2.2.51.1.10”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.1.3 At the end of the second sentence, add “or, for solid ammonium nitrate based fertilizers, Section 39 subject to the restrictions of 2.2.51.2.2, thirteenth indent”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 annex, as amended in ECE/TRANS/WP.15/AC.1/148)

2.2.51.1.4 Replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.1.5 In the first sentence, after “Section 34.4”, insert “or, for solid ammonium nitrate based fertilizers, Section 39”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1, annex)

Insert a new 2.2.51.1.7 to read as follows and renumber subsequent paragraphs accordingly:

“2.2.51.1.7 By exception, solid ammonium nitrate based fertilizers shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, Part III, Section 39.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.3, List of collective entries In “O”, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.51.3, List of collective entries In “O Oxidizing substances and articles containing such substances, without subsidiary hazard”, for “articles O3”, add the following new entry:

“3544 ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.1.7 At the end of the first paragraph, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.1.7, third indent      Replace “2.2.52.1.15 to 2.2.52.1.18” by “2.2.52.1.15 and 2.2.52.1.16”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.1.7      At the end, replace “2.2.52.1.16” by “7.1.7.3.6”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.1.15 to 2.2.52.1.17      Amend as follows:

Delete 2.2.52.1.15 and 2.2.52.1.16.

Renumber 2.2.52.1.17 as 2.2.52.1.15 and add the following new text after the Note: “See 7.1.7.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.1.18      Renumber as 2.2.52.1.16.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.3, List of collective entries      For P1 and P2, add the following new entry:

“3545      ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.4      At the end of the first paragraph, replace “4.2.5.2” by “4.2.5.2.6” and add a new sentence to read as follows: “The formulations listed in packing instruction IBC520 of 4.1.4.2 of ADR and in portable tank instruction T23 of 4.2.5.2.6 of ADR may also be carried packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1 of ADR, with the same control and emergency temperatures, if applicable.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.4 (table)      In the header of the last column, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.4 (table)      Insert the following new entries:

<i>Organic peroxide</i>	(2)	(3) (4) (5) (6) (7) (8) (9) (10) (11)
DIISOBUTYRYL PEROXIDE	≤ 42 (as a stable dispersion in water)	OP8 - 20 - 10 3119
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	≤ 42 (as a paste)	OP7 + 35 + 40 3116
1-PHENYLETHYL HYDROPEROXIDE	≤ 38	≥ 62      OP8      3109

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.52.4      After the table, in remarks 3, 13, 18 and 27, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.2      In the title of subdivision “T” replace “without subsidiary risk” by “without subsidiary hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.2      In “Toxic substances without subsidiary hazard” add the following new subdivision:

“T10 Articles”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.7.2 Replace “(see [footnote 6 in 2.2.8.1.54](#))” by “(see 2.2.8.1.4.5)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.11 In the second sentence, replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.11.2 Replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.1.12 Replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.3, List of collective entries Replace “risk(s)” by “hazard(s)” in all the headings.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.3, List of collective entries In “Toxic substances without subsidiary hazard”, add the following new row:

Articles	T10	3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.
----------	-----	------	---

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.61.3, List of collective entries In “Toxic substances with subsidiary hazard(s)”, for TF3, add:

“3535 TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.62.1.3 In the definition of “Patient specimens”, replace “human or animal materials,” by “those”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.62.1.12.2 Delete and insert “2.2.62.1.12.2 (Deleted)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Amend Section 2.2.8 as follows:

Amend 2.2.8.1(title) to read: “**2.2.8.1 Definition, general provisions and criteria**”.

Delete existing 2.2.8.1.1 and insert the following paragraphs:

“2.2.8.1.1 *Corrosive substances* are substances which, by chemical action, will cause irreversible damage to the skin, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport. The heading of this class also covers other substances which form a corrosive liquid only in the presence of water, or which produce corrosive vapour or mist in the presence of natural moisture of the air.

2.2.8.1.2 For substances and mixtures that are corrosive to skin, general classification provisions are provided in 2.2.8.1.4. Skin corrosion refers to the production of irreversible damage to the skin, namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.

2.2.8.1.3 Liquids and solids which may become liquid during carriage, which are judged not to be skin corrosive shall still be considered for their potential to cause corrosion to certain metal surfaces in accordance with the criteria in 2.2.8.1.5.3 (c) (ii).

2.2.8.1.4 *General classification provisions*".

*Insert existing 2.2.8.1.2 (Class 8 subdivisions) renumbered as 2.2.8.1.4.1.*

*Delete previous 2.2.8.1.3 to 2.2.8.1.6.*

*Insert the following paragraphs:*

"2.2.8.1.4.2 Substances and mixtures of Class 8 are divided among the three packing groups according to their degree of danger in carriage:

- (a) *Packing group I:* very dangerous substances and mixtures;
- (b) *Packing group II:* substances and mixtures presenting medium danger;
- (c) *Packing group III:* substances and mixtures that present minor danger.

2.2.8.1.4.3 Allocation of substances listed in Table A of Chapter 3.2 to the packing groups in Class 8 has been made on the basis of experience taking into account such additional factors as inhalation risk (see 2.2.8.1.4.5) and reactivity with water (including the formation of dangerous decomposition products).

2.2.8.1.4.4 New substances and mixtures can be assigned to packing groups on the basis of the length of time of contact necessary to produce irreversible damage of intact skin tissue in accordance with the criteria in 2.2.8.1.5. Alternatively, for mixtures, the criteria in 2.2.8.1.6 can be used.

2.2.8.1.4.5 A substance or mixture meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC<sub>50</sub>) in the range of packing group I, but toxicity through oral ingestion or dermal contact only in the range of packing group III or less, shall be allocated to Class 8 (see 2.2.61.1.7.2).

2.2.8.1.5 *Packing group assignment for substances and mixtures*

2.2.8.1.5.1 Existing human and animal data including information from single or repeated exposure shall be the first line of evaluation, as they give information directly relevant to effects on the skin.

2.2.8.1.5.2 In assigning the packing group in accordance with 2.2.8.1.4.4, account shall be taken of human experience in instances of accidental exposure. In the absence of human experience the assignment shall be based on data obtained from experiments in accordance with OECD Test Guideline 404<sup>1</sup> or 435<sup>2</sup>. A substance or mixture which is determined not to be corrosive in accordance with OECD Test Guideline 430<sup>3</sup> or 431<sup>4</sup> may be considered not to be corrosive to skin for the purposes of ~~ADR-ADN~~ without further testing.

2.2.8.1.5.3 Packing groups are assigned to corrosive substances in accordance with the following criteria (see table 2.2.8.1.5.3):

---

<sup>1</sup> OECD Guideline for the testing of chemicals No. 404 "Acute Dermal Irritation/Corrosion" 2015

<sup>2</sup> OECD Guideline for the testing of chemicals No. 435 "In Vitro Membrane Barrier Test Method for Skin Corrosion" 2015

<sup>3</sup> OECD Guideline for the testing of chemicals No. 430 "In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)" 2015

<sup>4</sup> OECD Guideline for the testing of chemicals No. 431 "In Vitro Skin Corrosion: Human Skin Model Test" 2015

- (a) Packing group I is assigned to substances that cause irreversible damage of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of three minutes or less;
- (b) Packing group II is assigned to substances that cause irreversible damage of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than three minutes but not more than 60 minutes;
- (c) Packing group III is assigned to substances that:
- (i) Cause irreversible damage of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours; or
  - (ii) Are judged not to cause irreversible damage of intact skin tissue but which exhibit a corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574 or Unified Numbering System (UNS) G10200 or a similar type or SAE 1020, and for testing aluminium, non-clad, types 7075-T6 or AZ5GU-T6 shall be used. An acceptable test is prescribed in the Manual of Tests and Criteria, Part III, Section 37.

*NOTE: Where an initial test on either steel or aluminium indicates the substance being tested is corrosive the follow up test on the other metal is not required.*

**Table 2.2.8.1.5.3: Table summarizing the criteria in 2.2.8.1.5.3**

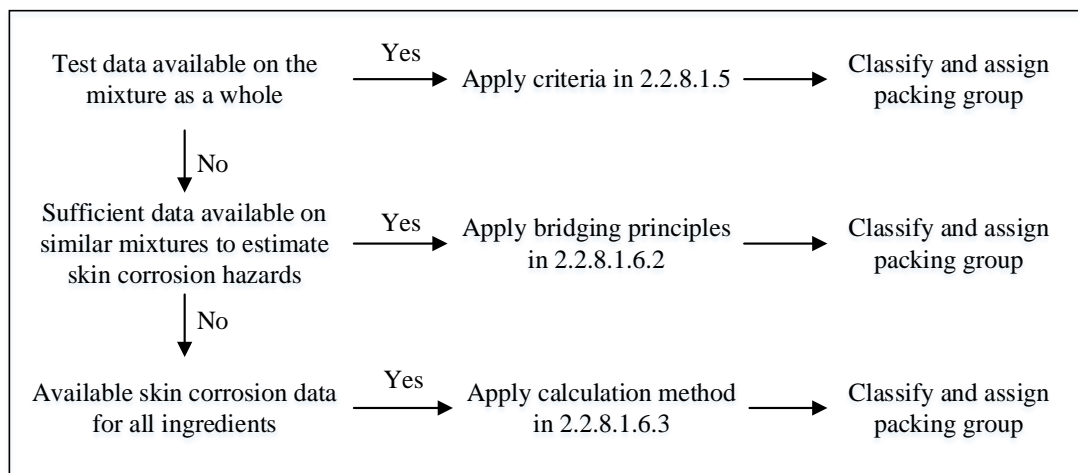
Packing Group	Exposure Time	Observation Period	Effect
I	≤ 3 min	≤ 60 min	Irreversible damage of intact skin
II	> 3 min ≤ 1 h	≤ 14 d	Irreversible damage of intact skin
III	> 1 h ≤ 4 h	≤ 14 d	Irreversible damage of intact skin
III	-	-	Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both materials

2.2.8.1.6 *Alternative packing group assignment methods for mixtures: Step-wise approach*

2.2.8.1.6.1 General provisions

For mixtures it is necessary to obtain or derive information that allows the criteria to be applied to the mixture for the purpose of classification and assignment of packing groups. The approach to classification and assignment of packing groups is tiered, and is dependent upon the amount of information available for the mixture itself, for similar mixtures and/or for its ingredients. The flow chart of Figure 2.2.8.1.6.1 below outlines the process to be followed:

**Figure 2.2.8.1.6.1: Step-wise approach to classify and assign packing group of corrosive mixtures**



#### 2.2.8.1.6.2 Bridging principles

Where a mixture has not been tested to determine its skin corrosion potential, but there are sufficient data on both the individual ingredients and similar tested mixtures to adequately classify and assign a packing group for the mixture, these data will be used in accordance with the following bridging principles. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture.

(a) **Dilution:** If a tested mixture is diluted with a diluent which does not meet the criteria for Class 8 and does not affect the packing group of other ingredients, then the new diluted mixture may be assigned to the same packing group as the original tested mixture.

**NOTE:** In certain cases, diluting a mixture or substance may lead to an increase in the corrosive properties. If this is the case, this bridging principle cannot be used.

(b) **Batching:** The skin corrosion potential of a tested production batch of a mixture can be assumed to be substantially equivalent to that of another untested production batch of the same commercial product when produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the skin corrosion potential of the untested batch has changed. If the latter occurs, a new classification is necessary.

(c) **Concentration of mixtures of packing group I:** If a tested mixture meeting the criteria for inclusion in packing group I is concentrated, the more concentrated untested mixture may be assigned to packing group I without additional testing.

(d) **Interpolation within one packing group:** For three mixtures (A, B and C) with identical ingredients, where mixtures A and B have been tested and are in the same skin corrosion packing group, and where untested mixture C has the same Class 8 ingredients as mixtures A and B but has concentrations of Class 8 ingredients intermediate to the concentrations in mixtures A and B, then mixture C is assumed to be in the same skin corrosion packing group as A and B.

(e) **Substantially similar mixtures:** Given the following:

- (i) Two mixtures: (A+B) and (C+B);
- (ii) The concentration of ingredient B is the same in both mixtures;
- (iii) The concentration of ingredient A in mixture (A+B) equals the concentration of ingredient C in mixture (C+B);
- (iv) Data on skin corrosion for ingredients A and C are available and substantially equivalent, i.e. they are the same skin corrosion packing group and do not affect the skin corrosion potential of B.

If mixture (A+B) or (C+B) is already classified based on test data, then the other mixture may be assigned to the same packing group.

#### 2.2.8.1.6.3 Calculation method based on the classification of the substances

2.2.8.1.6.3.1 Where a mixture has not been tested to determine its skin corrosion potential, nor is sufficient data available on similar mixtures, the corrosive properties of the substances in the mixture shall be considered to classify and assign a packing group.

Applying the calculation method is only allowed if there are no synergistic effects that make the mixture more corrosive than the sum of its substances. This restriction applies only if packing group II or III would be assigned to the mixture.

2.2.8.1.6.3.2 When using the calculation method, all Class 8 ingredients present at a concentration of  $\geq 1\%$  shall be taken into account, or  $< 1\%$  if these ingredients are still relevant for classifying the mixture to be corrosive to skin.

2.2.8.1.6.3.3 To determine whether a mixture containing corrosive substances shall be considered a corrosive mixture and to assign a packing group, the calculation method in the flow chart in Figure 2.2.8.1.6.3 shall be applied.

2.2.8.1.6.3.4 When a specific concentration limit (SCL) is assigned to a substance following its entry in Table A of Chapter 3.2 or in a special provision, this limit shall be used instead of the generic concentration limits (GCL). This appears where 1% is used in the first step for the assessment of the packing group I substances, and where 5% is used for the other steps respectively in Figure 2.2.8.1.6.3.

2.2.8.1.6.3.5 For this purpose, the summation formula for each step of the calculation method shall be adapted. This means that, where applicable, the generic concentration limit shall be substituted by the specific concentration limit assigned to the substance(s) ( $SCL_i$ ), and the adapted formula is a weighted average of the different concentration limits assigned to the different substances in the mixture:

$$\frac{PGx_1}{GCL} + \frac{PGx_2}{SCL_2} + \dots + \frac{PGx_i}{SCL_i} \geq 1$$

Where:

PG  $x_i$  = concentration of substance 1, 2 ...i in the mixture, assigned to packing group x (I, II or III)

GCL = generic concentration limit

$SCL_i$  = specific concentration limit assigned to substance i

The criterion for a packing group is fulfilled when the result of the calculation is  $\geq 1$ . The generic concentration limits to be used for the evaluation in each step of the calculation method are those found in Figure 2.2.8.1.6.3.

Examples for the application of the above formula can be found in the note below.

**NOTE:** Examples for the application of the above formula

*Example 1: A mixture contains one corrosive substance in a concentration of 5% assigned to packing group I without a specific concentration limit:*

*Calculation for packing group I:  $\frac{5}{5 (GCL)} = 1 \rightarrow$  assign to Class 8, packing group I.*

*Example 2: A mixture contains three substances corrosive to skin; two of them (A and B) have specific concentration limits; for the third one (C) the generic concentration limit applies. The rest of the mixture needs not to be taken into consideration:*

Substance X in the mixture and its packing group assignment within Class 8	Concentration (conc) in the mixture in %	Specific concentration limit (SCL) for packing group I	Specific concentration limit (SCL) for packing group II	Specific concentration limit (SCL) for packing group III
A, assigned to packing group I	3	30%	none	none
B, assigned to packing group I	2	20%	10%	none
C, assigned to packing group III	10	none	none	none

*Calculation for packing group I:  $\frac{3 (conc A)}{30 (SCL PG I)} + \frac{2 (conc B)}{20 (SCL PG I)} = 0,2 < 1$*

*The criterion for packing group I is not fulfilled.*

*Calculation for packing group II:  $\frac{3 (conc A)}{5 (GCL PG II)} + \frac{2 (conc B)}{10 (SCL PG II)} = 0,8 < 1$*

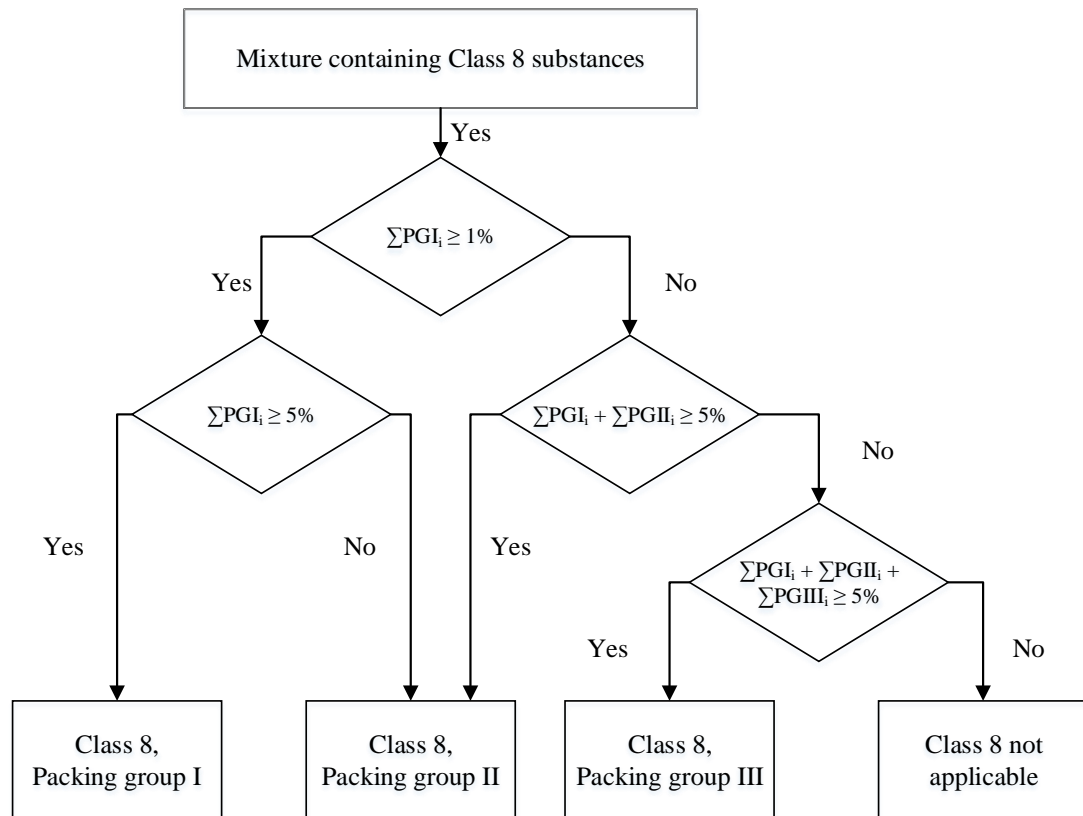
*The criterion for packing group II is not fulfilled.*

*Calculation for packing group III:  $\frac{3 (conc A)}{5 (GCL PG III)} + \frac{2 (conc B)}{5 (GCL PG III)} + \frac{10 (conc C)}{5 (GCL PG III)} = 3 \geq 1$*

*The criterion for packing group III is fulfilled, the mixture shall be assigned to Class 8, packing group III.*



Figure 2.2.8.1.6.3: Calculation method



”.

2.2.8.1.7 and Note and 2.2.8.1.8 Remain unchanged.

2.2.8.1.9 Delete and insert “2.2.8.1.9 Deleted”.

Existing Note before 2.2.8.2 remains unchanged.

2.2.8.2 (title), 2.2.8.2.1 and 2.2.8.2.2 Remain unchanged.

2.2.8.3, List of collective entries Keep existing text with the following amendment: In “Articles C11”, add the following entry “3547 ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)

2.2.9.1.2 The amendment does not apply to the English text.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.9.1.7 At the end of the first paragraph, add the following Note:

“**NOTE:** For UN 3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT, see special provision 389 in Chapter 3.3.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.9.1.7 Add the following new sub-paragraphs (f) and (g):

“(f) Lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see special provision 387 of Chapter 3.3) shall meet the following conditions:

- (i) The rechargeable lithium ion cells can only be charged from the primary lithium metal cells;
- (ii) Overcharge of the rechargeable lithium ion cells is precluded by design;
- (iii) The battery has been tested as a lithium primary battery;
- (iv) Component cells of the battery shall be of a type proved to meet the respective testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3.

(g) Manufacturers and subsequent distributors of cells or batteries shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.1.14 Amend the heading to read “Other substances and articles presenting a danger during carriage but not meeting the definitions of another class”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.1.14 The amendment to the entry for “Low hazard dithionites” does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.1.14 After “Vehicles, engines and machinery, internal combustion”, insert the following new line: “Articles containing miscellaneous dangerous goods”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.1.14 Amend existing entry for UN 2071 AMMONIUM NITRATE FERTILIZERS, including Notes 1 and 2 to read as follows: “UN 2071 AMMONIUM NITRATE BASED FERTILIZERS;

*NOTE: Solid ammonium nitrate based fertilizers shall be classified in accordance with the procedures as set out in the Manual of Tests and Criteria, Part III, Section 39.*”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended)*

2.2.9.1.14 In the Note, delete “UN No. 2071 ammonium nitrate fertilizers, UN No. 2216 fish meal (fish scrap), stabilized.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended)*

2.2.9.1.14 In the Note, replace “, UN No. 3335 aviation regulated solid, n.o.s. and UN No. 3363 dangerous goods in machinery or dangerous goods in apparatus” by “and UN No. 3335 aviation regulated solid, n.o.s.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.3, List of entries For “Lithium batteries M4”, add the following new entry:

“3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

2.2.9.3, List of entries The amendment to the title of subdivision M11 does not apply to the English text.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.9.3, List of entries For “Other substances or articles presenting a danger during carriage, but not meeting the definitions of another class M11”, add the following new entries:

“2071 AMMONIUM NITRATE BASED FERTILIZER  
3363 DANGEROUS GOODS IN MACHINERY or  
3363 DANGEROUS GOODS IN APPARATUS  
3548 ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS  
N.O.S.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

2.2.9.3, List of entries For “Other substances or articles presenting a danger during carriage, but not meeting the definitions of another class M11”, at the top of the list of entries, delete “No collective entry available.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

## Chapter 2.4

~~2.2.9.1-10.4.6.5~~2.4.4.6.5 At the end, delete “with the additional statement that: “x percent of the mixture consists of ingredients(s) of unknown hazards to the aquatic environment””.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

## Chapter 3.1

3.1.2.2 Amend the first sentence to read as follows: “When a combination of several distinct proper shipping names are listed under a single UN number, and these are separated by “and” or “or” in lower case or are punctuated by commas, only the most appropriate shall be shown in the transport document and package marks.”. Delete the second sentence.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

3.1.2.6 (a) After “Chapter 3.3,” insert “7.1.7,”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

3.1.2.6 Sub-paragraph (b) becomes sub-paragraph (c). Add the following new sub-paragraph (b):

“(b) Unless it is already included in capital letters in the name indicated in Column (2) of Table A in Chapter 3.2, the words “TEMPERATURE CONTROLLED” shall be added as part of the proper shipping name;”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

3.1.2.8.1.1 The amendment does not apply to the English text.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

3.1.2.8.1.2 Amend the first sentence to read as follows: “When a mixture of dangerous goods or articles containing dangerous goods are described by one of the “N.O.S.” or “generic” entries to which special provision 274 has been allocated in Column (6) of Table A in Chapter 3.2, not more than the two constituents which most predominantly contribute to the hazard or hazards of the mixture or of the articles need to be shown, excluding

controlled substances when their disclosure is prohibited by national law or international convention.”. In the second sentence, replace “risk label” by “hazard label” (twice).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

3.1.2.8.1.3 Add the following new example at the end:

“UN 3540 ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S. (pyrrolidine)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Chapter 3.2

3.2.1 In the explanatory text for column (3b), in the penultimate indent, delete “, 8”. Add a new indent right after to read as follows:

“- For dangerous substances or articles of Class 8, the codes are explained in 2.2.8.1.4.1;”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)*

### Table A

For UN Nos. 0349, 0367, 0384 and 0481, insert “347” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN Nos. 1011, 1049, 1075, 1954, 1965, 1969, 1971, 1972, 1978, insert “392” and delete “660” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 2067, in column (6) delete “186”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 2071, in Column (2), amend the designation to read “AMMONIUM NITRATE BASED FERTILIZER”. ~~In Column (3b), insert “M11”.~~

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN Nos. 3090, 3091, 3480 and 3481, in column (6) insert “387”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 3166, delete “312” and “385” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN Nos. 3166 and 3171, insert “388” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 3171, delete “240” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 3302 in column (2) add at the end of the designation “, STABILIZED” and in column (6), add “386”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 3316, delete the second entry corresponding to packing group III. In the remaining entry, in column (5), delete “II” and insert “671” in column (6).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

For UN No. 3363, amend the entry to read as follows:

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8) – (13)
3363	DANGEROUS GOODS IN MACHINERY or DANGEROUS GOODS IN APPARATUS	9	M11		9	301 672	0	E0	

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

## Add the following new entries:

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	TF3	I	6.1 +4.1	274	0	E5		<b>PP, EP, EX, A</b>	<b>VE01</b>		<b>2</b>	
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	TF3	II	6.1 +4.1	274	500 g	E4		<b>PP, EP, EX, A</b>	<b>VE01</b>		<b>2</b>	
3536	LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	9	M4		9A	389	0	E0		<b>PP</b>			<b>0</b>	
3537	ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	2	6F		See 5.2.2.1.12	274 667	0	E0		<b>PP, EX,A</b>	<b>VE01</b>		<b>1</b>	
3538	ARTICLES CONTAINING NON- FLAMMABLE, NON TOXIC GAS, N.O.S.	2	6A		See 5.2.2.1.12	274 667	0	E0		<b>PP</b>			<b>0</b>	
3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.	2	6T		See 5.2.2.1.12	274 667	0	E0		<b>PP, EP, TOX, A</b>	<b>VE02</b>		<b>2</b>	
3540	ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	3	F3		See 5.2.2.1.12	274 667	0	E0		<b>PP, EX, A</b>	<b>VE01</b>		<b>1</b>	
3541	ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	4.1	F4		See 5.2.2.1.12	274 667	0	E0		<b>PP</b>			<b>0</b>	

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	4.2	S6		See 5.2.2.1.12	274 667	0	E0		<b>PP</b>			<b>0</b>	
3543	ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.	4.3	W3		See 5.2.2.1.12	274 667	0	E0		<b>PP, EX, A</b>	<b>VE01</b>	<b>HA08</b>	<b>0</b>	
3544	ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	5.1	O3		See 5.2.2.1.12	274 667	0	E0		<b>PP</b>			<b>0</b>	
3545	ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	5.2	P1 or P2		See 5.2.2.1.12	274 667	0	E0		<b>PP, EX, A</b>	<b>VE01</b>		<b>0</b>	
3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	6.1	T10		See 5.2.2.1.12	274 667	0	E0		<b>PP, EP, TOX, A</b>	<b>VE02</b>		<b>0</b>	
3547	ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	8	C11		See 5.2.2.1.12	274 667	0	E0		<b>PP, EP</b>			<b>0</b>	
3548	ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	9	M11		See 5.2.2.1.12	274 667	0	E0		<b>PP</b>			<b>0</b>	

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

### 3.2.2, Table B

(Reference document for all amendments in Table B: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)

For UN No. 3302, “2-DIMETHYLAMINOETHYL ACRYLATE”, in column “Name and description” add at the end “, STABILIZED”.

For UN No. 3363, in column “Name and description”, replace “Dangerous goods in machinery or dangerous goods in apparatus” by “DANGEROUS GOODS IN MACHINERY OR DANGEROUS GOODS IN APPARATUS”. Under “Note/Remarks”, delete “Not subject to ADN (see also 1.1.3.1 (b)).”.

For UN No. 2071, in column “Name and description”, replace “Ammonium nitrate based fertilizer, uniform mixtures of the nitrogen/phosphate, nitrogen/potash or nitrogen/phosphate/potash type, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material” by “AMMONIUM NITRATE BASED FERTILIZER”. ~~In column “Remarks”, delete “Not subject to ADR”.~~

Add the following new entries in alphabetical order:

ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	2	3537
ARTICLES CONTAINING NON-FLAMMABLE, NON TOXIC GAS, N.O.S.	2	3538
ARTICLES CONTAINING TOXIC GAS, N.O.S.	2	3539
ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	3	3540
ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	4.1	3541
ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	4.2	3542
ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.	4.3	3543
ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	5.1	3544
ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	5.2	3545
ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	6.1	3546
ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	8	3547
ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	9	3548
LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	9	3536
TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	3535



## Chapter 3.3

3.3.1 In the third sentence, replace “such as “Damaged Lithium Batteries”” by “such as “LITHIUM BATTERIES FOR DISPOSAL””.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 23 The amendment does not apply to the English text.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 61 The amendment does not apply to the English text.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 122 Replace “risks” by “hazards”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 172 In the introductory sentence and in (c), replace “risk(s)” by “hazard(s)”. In (a), (b) and (d) replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Delete special provision 186 and insert: “186 (Deleted)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 188 After (b), add the following new Note:

**NOTE:** When lithium batteries in conformity with 2.2.9.1.7 (f) are carried in accordance with this special provision, the total lithium content of all lithium metal cells contained in the battery shall not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery shall not exceed 10 Wh (see special provision 387).”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 188 (c) Replace “2.2.9.1.7 (a) and (e)” by “2.2.9.1.7 (a), (e), (f) if applicable, and (g)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)

Special provision 188 (d) Replace “protection against contact with conductive materials” by “protection against contact with electrically conductive material”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 188 (f) At the end, add the following:

“When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word “OVERPACK”. The lettering of the “OVERPACK” mark shall be at least 12 mm high.

**NOTE:** Packages containing lithium batteries packed in conformity with the provisions of Part 4, Chapter 11, packing instructions 965 or 968 Section IB of the ICAO Technical Instructions that bear the mark as shown in 5.2.1.9 (lithium battery mark) and the label shown in 5.2.2.2.2, model No. 9A shall be deemed to meet the provisions of this special provision.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 188, in the first paragraph after (h) Add the following sentence at the end: “As used in this special provision “equipment” means apparatus for which the lithium cells or batteries will provide electrical power for its operation.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Delete special provision 240 and insert: “240 (Deleted)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 251 Amend as follows:

*In the first paragraph, replace the last sentence by:*

“Such kits shall only contain dangerous goods that are permitted as:

(a) Excepted quantities not exceeding the quantity indicated by the code in column (7b) of Table A of Chapter 3.2, provided that the net quantity per inner packaging and net quantity per package are as prescribed in 3.5.1.2 and 3.5.1.3; or;

(b) Limited quantities as indicated in column (7a) of Table A of Chapter 3.2, provided that the net quantity per inner packaging does not exceed 250 ml or 250 g.”.

*In the second paragraph, delete the last sentence.*

*In the third paragraph, insert a new first sentence to read as follows:*

“For the purposes of completion of the transport document as set out in 5.4.1.1.1, the packing group shown on the document shall be the most stringent packing group assigned to any individual substance in the kit.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 280 The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 290 (b) In the first sentence, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 293 (b) After “Safety matches are”, replace “matches which” by “matches that”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 307 Amend to read as follows:

“307 This entry may only be used for ammonium nitrate based fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, Part III, Section 39 subject to the restrictions of 2.2.51.2.2, thirteenth indent. When used in the said Section 39, the term “competent authority” means the competent authority of the country of origin. If the country of origin is not a Contracting Party to ~~ADR~~ADN, the classification and conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ~~ADR~~ADN reached by the consignment.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 and annex as amended in EXE/TRANS/WP.15/AC.1/148/Add.1)*

Special provision 310 In the first paragraph, replace “cells and batteries” by “cells or batteries”, twice, and add “or LP905 of 4.1.4.3 of ADR, as applicable” at the end.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Delete special provision 312 and insert: “312 (Deleted)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 339 (b) The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 361 (b) The amendment does not apply to the English text.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 363 Add the following new introductory sentence: “This entry may only be used when the conditions of this special provision are met. No other requirements of ~~ADR-ADN~~ apply.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 363 (f) At the end, replace “requirements of 2.2.9.1.7” by “provisions of 2.2.9.1.7”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 363 Add a new sub-paragraph (m) to read as follows:

“(m) The requirements specified in packing instruction P005 of 4.1.4.1 of ADR shall be met.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 369 In the first paragraph, replace “risks” by “hazards”. In the third paragraph, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

Special provision 376 Amend the text after the third paragraph to read as follows:

“Cells and batteries shall be packed in accordance with packing instructions P908 of 4.1.4.1 of ADR or LP904 of 4.1.4.3 of ADR, as applicable.

Cells and batteries identified as damaged or defective and liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of carriage shall be packed and carried in accordance with packing instruction P911 of 4.1.4.1 of ADR or LP906 of 4.1.4.3 of ADR, as applicable. Alternative packing and/or carriage conditions may be authorized by the competent authority of any ~~ADR-ADN~~ Contracting Party who may also recognize an approval granted by the competent authority of a country which is not an ~~ADR-ADN~~ Contracting Party provided that this approval has been granted in accordance with the procedures applicable according to RID, ADR, ADN, the IMDG Code or the ICAO Technical Instructions. In both cases the cells and batteries are assigned to transport category 0.

Packages shall be marked "DAMAGED/DEFECTIVE LITHIUM-ION BATTERIES" or "DAMAGED/DEFECTIVE LITHIUM METAL BATTERIES", as applicable.

The transport document shall include the following statement “Transport in accordance with special provision 376”.

If applicable, a copy of the competent authority approval shall accompany the carriage.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)*

Special provision 377 In the second paragraph, replace “requirements of 2.2.9.1.7 (a) to (e)” by “provisions of 2.2.9.1.7 (a) to (g)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 385 Delete and insert “385 (Deleted)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 386 In the first sentence, after “2.2.41.1.17,” insert “7.1.7,”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“387 – 499 Reserved” Replace by “393 – 499 Reserved”.

Special provision 663 Under “General provisions:”, replace “risk” by “hazard” (twice).

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 667 In (a), (b), (b) (i) and (b) (ii), replace “or machinery” by “, machinery or article” and add the following new sub-paragraph (c):

“(c) The procedures described in (b) also apply to damaged lithium cells or batteries in vehicles, engines, machinery or articles.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

Special provision 667 (a) and (b) Replace “requirements of 2.2.9.1.7” by “provisions of 2.2.9.1.7”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

3.3.1 Add the following new special provisions:

“193 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 number are subject to the requirements of ADN only when carried in bulk. ~~unless shown by a Trough Test (see Manual of Tests and Criteria, Part III, sub section 38.2) not to be liable to self-sustaining decomposition.”.~~

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“301 This entry only applies to machinery or apparatus containing dangerous goods as a residue or an integral element of the machinery or apparatus. It shall not be used for machinery or apparatus for which a proper shipping name already exists in Table A of Chapter 3.2. Machinery and apparatus carried under this entry shall only contain dangerous goods which are authorized to be carried in accordance with the provisions of Chapter 3.4 (Limited quantities). The quantity of dangerous goods in machinery or apparatus shall not exceed the quantity specified in Column (7a) of Table A of Chapter 3.2 for each item of dangerous goods contained. If the machinery or apparatus contains more than one item of dangerous goods, the individual dangerous goods shall be enclosed to prevent them reacting dangerously with one another during carriage (see 4.1.1.6 of ADR). When it is required to ensure liquid dangerous goods remain in their intended orientation, orientation arrows shall be displayed on at least two opposite vertical sides with the arrows pointing in the correct direction in accordance with 5.2.1.10.

[NOTE: In this special provision the reference to “a proper shipping name which already exists” excludes specific n.o.s. entries for UN Nos. 3537 to 3548.”.]”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148)

“387 Lithium batteries in conformity with 2.2.9.1.7 (f) containing both primary lithium metal cells and rechargeable lithium ion cells shall be assigned to UN Nos. 3090 or 3091 as appropriate. When such batteries are carried in accordance with special provision

188, the total lithium content of all lithium metal cells contained in the battery shall not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery shall not exceed 10 Wh.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“388 UN No. 3166 entries apply to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.

Vehicles powered by a fuel cell engine shall be assigned to the entries UN [No. 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED](#) or UN [No. 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED](#), as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

Other vehicles which contain an internal combustion engine shall be assigned to the entries UN [No. 3166 VEHICLE, FLAMMABLE GAS POWERED](#) or UN [No. 3166 VEHICLE, FLAMMABLE LIQUID POWERED](#), as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it shall be assigned to UN [No. 3166 VEHICLE, FLAMMABLE GAS POWERED](#).

Entry UN [No. 3171](#) only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries carried with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with a motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheelchairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. This includes vehicles carried in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be assigned to the entries UN [No. 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT](#) or UN [No. 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT](#) or UN [No. 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT](#) or UN [No. 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT](#), as appropriate.

Dangerous goods, such as batteries, airbags, fire extinguishers, compressed gas accumulators, safety devices and other integral components of the vehicle that are necessary for the operation of the vehicle or for the safety of its operator or passengers, shall be securely installed in the vehicle and are not otherwise subject to [ADR/ADN](#). However, lithium batteries shall meet the provisions of 2.2.9.1.7, except as otherwise provided for in special provision 667.

Where a lithium battery installed in a vehicle or equipment is damaged or defective, the vehicle or equipment shall be carried in accordance with the conditions defined in special provision 667 (c).”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“389 This entry only applies to cargo transport units in which lithium ion batteries or lithium metal batteries are installed and which are designed only to provide power external to the unit. The lithium batteries shall meet the provisions of 2.2.9.1.7 (a) to (g) and contain the necessary systems to prevent overcharge and over discharge between the batteries. The batteries shall be securely attached to the interior structure of the cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings and vibrations normally incident to carriage. Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to ADN. Dangerous goods not necessary for the safe and proper operation of the cargo transport unit shall not be carried within the cargo transport unit.

The batteries inside the cargo transport unit are not subject to marking or labelling requirements. The cargo transport unit shall bear orange-coloured plates in accordance with 5.3.2.2 and placards in accordance with 5.3.1.1 on two opposing sides.”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)*

“390 (Reserved)”.

“391 (Reserved)”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

“392 For the carriage of fuel gas containment systems designed and approved to be fitted in motor vehicles containing this gas the provisions of sub-section 4.1.4.1 and Chapter 6.2 of ADR need not be applied when carried for disposal, recycling, repair, inspection, maintenance or from where they are manufactured to a vehicle assembly plant, provided the following conditions are met:

(a) The fuel gas containment systems shall meet the requirements of the standards or regulations for fuel tanks for vehicles, as applicable. Examples of applicable standards and regulations are:

<b>LPG tanks</b>	
ECE Regulation No. 67 Revision 2	Uniform provisions concerning: I. Approval of specific equipment of vehicles of category M and N using liquefied petroleum gases in their propulsion system; II. Approval of vehicles of category M and N fitted with specific equipment for the use of liquefied petroleum gases in their propulsion system with regard to the installation of such equipment
ECE Regulation No. 115	Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system
<b>CNG and LNG tanks</b>	

ECE Regulation No. 110	Uniform provisions concerning the approval of: I. Specific components of motor vehicles using compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system
ECE Regulation No. 115	Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system
ISO 11439:2013	Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles
ISO 15500-Series	Road vehicles -- Compressed natural gas (CNG) fuel system components – several parts as applicable
ANSI NGV 2	Compressed natural gas vehicle fuel containers
CSA B51 Part 2:2014	Boiler, pressure vessel, and pressure piping code Part 2 Requirements for high-pressure cylinders for on-board storage of fuels for automotive vehicles
<b>Hydrogen pressure tanks</b>	
Global Technical Regulation (GTR) No. 13	Global technical regulation on hydrogen and fuel cell vehicles (ECE/TRANS/180/Add.13).
ISO/TS 15869:2009	Gaseous hydrogen and hydrogen blends - Land vehicle fuel tanks
Regulation (EC) No.79/2009	Regulation (EC) No. 79/2009 of the European Parliament and of the Council of 14 January 2009 on type approval of hydrogen-powered motor vehicles, and amending Directive 2007/46/EC
Regulation (EU) No. 406/2010	Commission Regulation (EU) No 406/2010 of 26 April 2010 implementing Regulation (EC) No 79/2009 of the European Parliament and of the Council on type-approval of hydrogen-powered motor vehicles
ECE Regulation No. 134	Hydrogen and fuel cell vehicles (HFCV)
CSA B51 Part 2: 2014	Boiler, pressure vessel, and pressure piping code - Part 2: Requirements for high-pressure cylinders for on-board storage of fuels for automotive vehicles

Gas tanks designed and constructed in accordance with previous versions of relevant standards or regulations for gas tanks for motor vehicles, which were applicable at the time of the certification of the vehicles for which the gas tanks were designed and constructed may continue to be carried;

(b) The fuel gas containment systems shall be leakproof and shall not exhibit any signs of external damage which may affect their safety;

**NOTE 1:** Criteria may be found in standard ISO 11623:2015 Transportable gas cylinders – Periodic inspection and testing of composite gas cylinders (or ISO 19078:2013 Gas cylinders – Inspection of the cylinder installation, and requalification of high pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles).

**NOTE 2:** If the fuel gas containment systems are not leakproof or are overfilled or if they exhibit damage that could affect their safety (e.g. in case of a safety related recall), they shall only be carried in salvage pressure receptacles in conformity with **ADRADN**.

(c) If a fuel gas containment system is equipped with two valves or more integrated in line, the two valves shall be closed as to be gastight under normal conditions of carriage. If only one valve exists or only one valve works all openings with the exception of the opening of the pressure relief device, it shall be closed as to be gastight under normal conditions of carriage;

(d) Fuel gas containment systems shall be carried in such a way as to prevent obstruction of the pressure relief device or any damage to the valves and any other pressurised part of the fuel gas containment systems and unintentional release of the gas under normal conditions of carriage. The fuel gas containment system shall be secured in order to prevent slipping, rolling or vertical movement;

(e) Valves shall be protected by one of the methods described in 4.1.6.8 (a) to (e) of ADR;

(f) Except for the case of fuel gas containment systems removed for disposal, recycling, repair, inspection or maintenance, they shall be filled with not more than 20% of their nominal filling ratio or nominal working pressure, as applicable;

(g) Notwithstanding the provisions of Chapter 5.2, when fuel gas containment systems are consigned in a handling device, marks and labels may be affixed to the handling device; and

(h) Notwithstanding the provisions of 5.4.1.1.1 (f) the information on the total quantity of dangerous goods may be replaced by the following information:

- (i) The number of fuel gas containment systems; and
- (ii) In the case of liquefied gases the total net mass (kg) of gas of each fuel gas containment system and, in the case of compressed gases, the total water capacity (l) of each fuel gas containment system followed by the nominal working pressure.

Examples for information in the transport document:

Example 1: “UN 1971 natural gas, compressed, 2.1, 1 fuel gas containment system of 50 l in total, 200 bar”.

Example 2: “UN 1965 hydrocarbon gas mixture, liquefied, n.o.s., 2.1, 3 fuel gas containment systems, each of 15 kg net mass of gas”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“671 For the purposes of the exemption related to quantities carried ~~per-on board transport-unit~~vessels (see 1.1.3.6), the transport category shall be determined in relation to the packing group (see paragraph 3 of special provision 251):

- Transport category 3 for kits assigned to packing group III;
- Transport category 2 for kits assigned to packing group II;
- Transport category 1 for kits assigned to packing group I.”



(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)

“672 Machinery and apparatus carried under this entry and in conformity with special provision 301 are not subject to any other provision of ADN provided they are either:

- packed in a strong outer packaging constructed of suitable material, and of adequate strength and design in relation to the packaging’s capacity and its intended use, and meeting the applicable requirements of 4.1.1.1 of ADR; or
- carried without outer packaging if the machinery or apparatus is constructed and designed so that the receptacles containing the dangerous goods are afforded adequate protection.”

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

“673 (Reserved)”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

## Chapter 5.2

5.2.1 After the heading, renumber the Note as Note 1 and add a new Note 2:

“**NOTE 2:** In accordance with the GHS, a GHS pictogram not required by ADN should only appear in carriage as part of a complete GHS label and not independently (see GHS 1.4.10.4.4).”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.2.1.3 After “Salvage packagings” add “including large salvage packagings”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.2.1.10.1 In the second indent, at the end, delete “and”. In the third indent, at the end, replace the comma by “; and”. Add the following new fourth indent:

“- machinery or apparatus containing liquid dangerous goods when it is required to ensure the liquid dangerous goods remain in their intended orientation (see special provision 301 of Chapter 3.3),”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.2.2.1 Add the following new sub-section 5.2.2.1.12:

“5.2.2.1.12 *Special provisions for the labelling of articles containing dangerous goods carried as UN Nos. 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 and 3548*

5.2.2.1.12.1 Packages containing articles or articles carried unpackaged shall bear labels according to 5.2.2.1 reflecting the hazards established according to 2.1.5, except that for articles that in addition contain lithium batteries, a lithium battery mark or a label conforming to model No. 9A is not required.

5.2.2.1.12.2 When it is required to ensure articles containing liquid dangerous goods remain in their intended orientation, orientation arrows meeting 5.2.1.10.1 shall be affixed and visible on at least two opposite vertical sides of the package or of the unpackaged article where possible, with the arrows pointing in the correct upright direction.”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)

5.2.2.2.1.1.3 In the first sentence, after “the dimensions may be reduced” add “proportionally”. Delete the second and third sentences (“The line inside the edge shall remain 5 mm to the edge of the label. The minimum width of the line inside the edge shall remain 2 mm.”).

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

5.2.2.2.1.2 The amendment to the first paragraph does not apply to the English text. In the paragraph after the Note, replace “risk” by “hazard”.

*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*

5.2.2.2.1.3 The amendment does not apply to the English text.





*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*


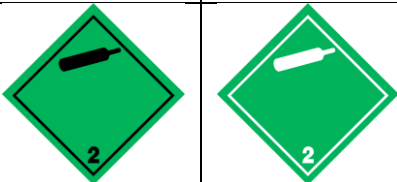

5.2.2.2.1.5 Replace “risk” by “hazard”.




*(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)*







5.2.2.2.2 Amend to read as follows:


“5.2.2.2.2 Specimen labels




Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
<b>Class 1 hazard: Explosive substances or articles</b>						
1	Divisions 1.1, 1.2, 1.3	Exploding bomb: black	Orange	1 (black)		** Place for division – to be left blank if explosive is the subsidiary hazard * Place for compatibility group – to be left blank if explosive is the subsidiary hazard
1.4	Division 1.4	1.4: black  Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.5	Division 1.5	1.5: black  Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.6	Division 1.6	1.6: black  Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
<b>Class 2 hazard: Gases</b>						
2.1	Flammable gases (except as provided for in 5.2.2.2.1.6 d))	Flame: black or white	Red	2 (black or white)		-
2.2	Non-flammable, non-toxic gases	Gas cylinder: black or white	Green	2 (black or white)		-
2.3	Toxic gases	Skull and crossbones: black	White	2 (black)		-


Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
<b>Class 3 hazard: Flammable liquids</b>						
3	-	Flame: black or white	Red	3 (black or white)		-
<b>Class 4.1 hazard: Flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances</b>						
4.1	-	Flame: black	White with 7 vertical red stripes	4 (black)		-
<b>Class 4.2 hazard: Substances liable to spontaneous combustion</b>						
4.2	-	Flame: black	Upper half white, lower half red	4 (black)		-
<b>Class 4.3 hazard: Substances which, in contact with water emit flammable gases</b>						




4.3	-	Flame: black or white	Blue	4 (black or white)			-
<b>Label model No.</b>	<b>Division or Category</b>	<b>Symbol and symbol colour</b>	<b>Background</b>	<b>Figure in bottom corner (and figure colour)</b>	<b>Specimen labels</b>		<b>Note</b>
<b>Class 5.1 hazard: Oxidizing substances</b>							
5.1	-	Flame over circle: black	Yellow	5.1 (black)			-
<b>Class 5.2 hazard: Organic peroxides</b>							
5.2	-	Flame: black or white	Upper half red, lower half yellow	5.2 (black)			-
<b>Class 6.1 hazard: Toxic substances</b>							
6.1	-	Skull and crossbones: black	White	6 (black)			-

Class 6.2 hazard: Infectious substances						
6.2	-	Three crescents superimposed on a circle: black	White	6 (black)		<p>The lower half of the label may bear the inscriptions: “INFECTIOUS SUBSTANCE” and</p> <p>“In the case of damage or leakage immediately notify Public Health Authority” in black colour</p>

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
<b>Class 7 hazard: Radioactive material</b>						
7A	Category I – WHITE	Trefoil: black	White	7 (black)		Text (mandatory), black in lower half of label: “RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...”  One red vertical bar shall follow the word: “RADIOACTIVE”
7B	Category II – YELLOW	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: “RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...”  In a black outlined box: “TRANSPORT INDEX”;  Two red vertical bars shall follow the word: “RADIOACTIVE”
7C	Category III – YELLOW	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: “RADIOACTIVE” “CONTENTS ...” “ACTIVITY ...”



						<p>In a black outlined box:  “TRANSPORT INDEX”.</p> <p>Three red vertical bars shall follow the word: “RADIOACTIVE”</p>
7E	Fissile material	-	White	7 (black)		<p>Text (mandatory): black in upper half of label: “FISSILE”;</p> <p>In a black outlined box in the lower half of label: “CRITICALITY SAFETY INDEX”</p>

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
<b>Class 8 hazard: Corrosive substances</b>						
8	-	Liquids, spilling from two glass vessels and attacking a hand and a metal: black	Upper half white, lower half black with white border	8 (white)		-
<b>Class 9 hazard: Miscellaneous dangerous substances and articles, including environmentally hazardous substances</b>						
9	-	7 vertical stripes in upper half: black	White	9 underlined (black)		-
9A	-	7 vertical stripes in upper half: black; battery group, one broken and emitting flame in lower half: black	White	9 underlined (black)		-

”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended in ECE/TRANS/WP.15/AC.1/148/Add.1)

## Chapter 5.3

5.3 In the title, after “CONTAINERS”, insert “, BULK CONTAINERS”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3 After the heading, renumber the Note as Note 1 and after “containers,” insert “bulk containers.”. Add the following new Note 2:

**“NOTE 2:** *In accordance with the GHS, a GHS pictogram not required by ADN should only appear in carriage as part of a complete GHS label and not independently (see GHS 1.4.10.4.4).”*

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.1.1.1 In the first sentence, after “containers”, insert “, bulk containers”. In the second sentence, after “container”, insert “, bulk container”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.1.1.3 In the first paragraph, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.1.1.5 Replace “risk” by “hazard” (twice).

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.1.2 In the title, after “containers”, insert “, bulk containers”. In the paragraph after the Note, at the end, add “and to two opposite sides of the bulk container”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.1.3 In the title, after “containers”, insert “, bulk containers”. In the paragraph after the Note, after “containers”, insert “, bulk containers”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.2.1.4 In the first sentence, replace “and containers” by “, containers and bulk containers” and replace “or container” by “, container or bulk container”. In the second sentence, replace “or in the container” (first occurrence) by “, in the container or in the bulk container”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.2.1.5 After “containers”, insert “, bulk containers”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.2.3.2 For hazard identification number 20, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.3.6.1 and 5.3.6.2 After “containers”, insert “, bulk containers”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

## Chapter 5.4

5.4.1.1.1 (c) In the Note, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.1.1 (d) In the Note, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.1.5 In the heading and the following sentence, after “salvage packagings” add “including large salvage packagings”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.1.6.2.1 (b) In the first paragraph replace “risk(s)” by “hazard(s)”. In the second paragraph, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.1.15 Replace “2.2.41.1.17” by “7.1.7”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.1.19 In the first paragraph replace “risk(s)” by “hazard(s)”. In the second paragraph, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.2.3.1 Replace “2.2.52.1.15 to 2.2.52.1.17” by “2.2.52.1.15”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

5.4.1.2.5.1 (b) In the last sentence, replace “risk” by “hazard”.

(Reference document: ECE/TRANS/WP.15/AC.1/2017/26/Add.1)

## Chapter 7.1

7.1 Amend the heading to read “GENERAL PROVISIONS AND SPECIAL PROVISIONS FOR TEMPERATURE CONTROL”.

**7.1** Add the following new 7.1.7:

**“7.1.7 Special provisions applicable to the carriage of self-reactive substances of Class 4.1, organic peroxides of Class 5.2 and substances stabilized by temperature control (other than self-reactive substances and organic peroxides)”**

7.1.7.1 All self-reactive substances, organic peroxides and polymerizing substances shall be protected from direct sunlight and all sources of heat, and placed in adequately ventilated areas.

7.1.7.2 Where a number of packages are assembled in a container or closed vehicle, the total quantity of substance, the type and number of packages and the stacking arrangement shall not create an explosion hazard.

7.1.7.3 *Temperature control provisions*

7.1.7.3.1 These provisions apply to certain self-reactive substances when required by 2.2.41.1.17, and certain organic peroxides when required by 2.2.52.1.15 and certain polymerizing substances when required by 2.2.41.1.21 or special provision 386 of Chapter 3.3 which may only be carried under conditions where the temperature is controlled.

7.1.7.3.2 These provisions also apply to the carriage of substances for which:

- (a) The proper shipping name as indicated in column (2) of Table A of Chapter 3.2 or according to 3.1.2.6 contains the word “STABILIZED”; and
- (b) The SADT or SAPT determined for the substance (with or without chemical stabilization) as offered for carriage is:
  - (i) 50 °C or less for single packagings and IBCs; or
  - (ii) 45 °C or less for tanks.

When chemical inhibition is not used to stabilize a reactive substance which may generate dangerous amounts of heat and gas, or vapour, under normal carriage conditions, this substance needs to be carried under temperature control. These

provisions do not apply to substances which are stabilized by the addition of chemical inhibitors such that the SADT or the SAPT is greater than that prescribed in (b) (i) or (ii), above.

7.1.7.3.3 In addition, if a self-reactive substance or organic peroxide or a substance the proper shipping name of which contains the word “STABILIZED” and which is not normally required to be carried under temperature control is carried under conditions where the temperature may exceed 55 °C, it may require temperature control.

7.1.7.3.4 The “control temperature” is the maximum temperature at which the substance can be safely carried. It is assumed that during carriage the temperature of the immediate surroundings of the package does not exceed 55 °C and attains this value for a relatively short time only during each period of 24 hours. In the event of loss of temperature control, it may be necessary to implement emergency procedures. The “emergency temperature” is the temperature at which such procedures shall be implemented.

7.1.7.3.5 Derivation of control and emergency temperatures

Type of receptacle	SADT <sup>a</sup> /SAPT <sup>a</sup>	Control temperature	Emergency temperature
Single packagings and IBCs	20 °C or less	20 °C below SADT/SAPT	10 °C below SADT/SAPT
	over 20 °C to 35 °C	15 °C below SADT/SAPT	10 °C below SADT/SAPT
	over 35 °C	10 °C below SADT/SAPT	5 °C below SADT/SAPT
Tanks	≤ 45 °C	10 °C below SADT/SAPT	5 °C below SADT/SAPT

<sup>a</sup> i.e. the SADT/SAPT of the substance as packed for carriage.

7.1.7.3.6 The control and emergency temperatures are derived using the table in 7.1.7.3.5 from the SADT or from the SAPT which are defined as the lowest temperatures at which self-accelerating decomposition or self-accelerating polymerization may occur with a substance in the packaging, IBC or tank as used in carriage. An SADT or SAPT shall be determined in order to decide if a substance shall be subjected to temperature control during carriage. Provisions for the determination of the SADT and SAPT are given in Part II, section 28 of the Manual of Tests and Criteria.

7.1.7.3.7 Control and emergency temperatures, where appropriate, are provided for currently assigned self-reactive substances in 2.2.41.4 and for currently assigned organic peroxide formulations in 2.2.52.4.

7.1.7.3.8 The actual carriage temperature may be lower than the control temperature but shall be selected so as to avoid dangerous separation of phases.

7.1.7.4 *Carriage under temperature control*

7.1.7.4.1 Maintenance of the prescribed temperature is an essential feature of the safe carriage of substances stabilized by temperature control. In general, there shall be:

- (a) Thorough inspection of the cargo transport unit prior to loading;
- (b) Instructions to the carrier about the operation of the refrigeration system [including a list of the suppliers of coolant available en route];
- (c) Procedures to be followed in the event of loss of control;
- (d) Regular monitoring of operating temperatures; and
- (e) Provision of a back-up refrigeration system or spare parts.

7.1.7.4.2 Any control and temperature sensing devices in the refrigeration system shall be readily accessible and all electrical connections weather-proof. The

temperature of air space within the cargo transport unit shall be measured by two independent sensors and the output shall be recorded so that temperature changes are readily detectable. The temperature shall be checked every four to six hours and logged. When substances having a control temperature of less than +25 °C are carried, the cargo transport unit shall be equipped with visible and audible alarms, powered independently of the refrigeration system, set to operate at or below the control temperature.

7.1.7.4.3 If during carriage the control temperature is exceeded, an alert procedure shall be initiated involving any necessary repairs to the refrigeration equipment or an increase in the cooling capacity (e.g. by adding liquid or solid refrigerants). The temperature shall also be checked frequently and preparations made for implementation of the emergency procedures. If the emergency temperature is reached, the emergency procedures shall be initiated.

7.1.7.4.4 The suitability of a particular means of temperature control for carriage depends on a number of factors. Factors to be considered include:

- (a) The control temperature(s) of the substance(s) to be carried;
- (b) The difference between the control temperature and the anticipated ambient temperature conditions;
- (c) The effectiveness of the thermal insulation;
- (d) The duration of carriage; and
- (e) Allowance of a safety margin for delays.

7.1.7.4.5 Suitable methods for preventing the control temperature being exceeded are, in order of increasing control capability:

- (a) Thermal insulation provided that the initial temperature of the substance(s) to be carried is sufficiently below the control temperature;
- (b) Thermal insulation with coolant system provided that:
  - (i) An adequate quantity of [non-flammable] coolant (e.g. liquid nitrogen or solid carbon dioxide), allowing a reasonable margin for [possible] delay, is carried [or a means of replenishment is assured];
  - (ii) Liquid oxygen or air is not used as coolant;
  - (iii) There is a uniform cooling effect even when most of the coolant has been consumed; and
  - (iv) The need to ventilate the transport unit before entering is clearly indicated by a warning on the door(s) of the transport unit;
- (c) [Thermal insulation and] Single mechanical refrigeration provided that for substance(s) to be carried with a flash point lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings [, EEx IIB T3] are used within the cooling compartment to prevent ignition of flammable vapours [from the substances];
- (d) [Thermal insulation and] Combined mechanical refrigeration system with coolant system; provided that:
  - (i) The two systems are independent of one another;
  - (ii) The provisions in (b) and (c) are complied with;

- (e) [Thermal insulation and] Dual mechanical refrigeration system; provided that:
  - (i) Apart from the integral power supply unit, the two systems are independent of one another;
  - (ii) Each system alone is capable of maintaining adequate temperature control; and
  - (iii) For substance(s) to be carried with a flash point lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings [, EEx IIB T3] are used within the cooling compartment to prevent ignition of flammable vapours [from the substances].

7.1.7.4.6 The methods described in 7.1.7.4.5 (d) and (e) may be used for all organic peroxides and self-reactive substances and polymerizing substances.

The method described in 7.1.7.4.5 (c) may be used for organic peroxides and self-reactive substances of Types C, D, E and F and, when the maximum ambient temperature to be expected during carriage does not exceed the control temperature by more than 10 °C, for organic peroxides and self-reactive substances of Type B and polymerizing substances.

The method described in 7.1.7.4.5 (b) may be used for organic peroxides and self-reactive substances of Types C, D, E and F and polymerizing substances when the maximum ambient temperature to be expected during carriage does not exceed the control temperature by more than 30 °C.

The method described in 7.1.7.4.5 (a) may be used for organic peroxides and self-reactive substances of Types C, D, E and F and polymerizing substances when the maximum ambient temperature to be expected during carriage is at least 10 °C below the control temperature.

7.1.7.4.7 Where substances are required to be carried in insulated, refrigerated or mechanically-refrigerated vehicles or containers, these vehicles or containers shall satisfy the requirements of Chapter 9.6.

7.1.7.4.8 If substances are contained in protective packagings filled with a coolant, they shall be loaded in closed or sheeted vehicles or closed or sheeted containers. If the vehicles or containers used are closed they shall be adequately ventilated. Sheeted vehicles and containers shall be fitted with sideboards and a tailboard. The sheets of these vehicles and containers shall be of an impermeable and non-combustible material.”

*(Reference document ECE/TRANS/WP.15/AC.1/2017/26/Add.1 as amended by ECE/TRANS/WP.15/AC.1/148/Add.1)*