

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

23 May 2019

### Sub-Committee of Experts on the Transport of Dangerous Goods

#### Fifty-fifth session

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Item 3 of the provisional agenda

#### Listing, classification and packaging

## Limited and excepted quantities

### Transmitted by the expert from Canada

### Objective

1. Seek the support of the Sub-Committee to clarify Chapter 3.4 *Dangerous Goods Packed in Limited Quantities* and Chapter 3.5 *Dangerous Goods Packed in Excepted Quantities* to enhance understanding and maximize compliance.

### Background

2. The Model Regulations provides exemptions for the transportation of selected dangerous goods packed in small quantities. Related provisions for these exemptions are set out in Chapter 3.4 and Chapter 3.5
3. These provisions were adopted on the basis that the transportation of small quantities of certain dangerous goods contained in strong inner packagings poses a lesser risk than the same dangerous goods when they are packed in larger quantities, as indicated in the *Guiding Principles for the Development of the UN Model Regulations*.
4. Chapter 3.4 allows consignors transport small quantities of selected dangerous goods without complying with all the requirements imposed by the Regulations. Except that, for the air mode, ICAO Technical Instructions (TI) prescribes additional requirements due to the safety concerns related to transport by aircraft<sup>1</sup>.
5. Chapter 3.5 provides broader exemptions for the transportation of minute quantities of dangerous goods. Most importantly, multimodal harmonization is achieved. Dangerous goods packed and prepared in accordance with Chapter 3.5 can be transported seamlessly across all modes.
6. Both systems are independent of each other and require different set of conditions as illustrated in the following table:

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<sup>1</sup> UN/SCETDG/16/inf8.pdf, UN/SCETDG/23/inf3e.pdf, UN/SCETDG/23/inf30e.pdf, UN/SCETDG/24/inf58e.pdf, UN/SCETDG/24/inf8e.pdf

Requirements	Limited quantities provisions	Excepted quantities provisions
Packaging	<ul style="list-style-type: none"> <li>• UN performance tests and UN certification are not required;</li> <li>• Combination packaging. <i>(*For air transport, additional provisions apply)</i></li> </ul>	<ul style="list-style-type: none"> <li>• UN certification is not required;</li> <li>• UN Performance tests are required:               <ul style="list-style-type: none"> <li>(a) 1.8 meter-high drop;</li> <li>(b) Stacking test (a force applied to the top surface of package);</li> </ul> </li> <li>• Triple packaging.</li> </ul>
Maximum weight/ quantity	Maximum gross mass of package: <ul style="list-style-type: none"> <li>• 30 kg for combination packages;</li> <li>• 20 kg for shrink or stretch-wrapped trays</li> </ul> <i>(*For air transport, inner packaging and per-package quantities are in some cases lower)</i>	Maximum quantity of dangerous goods per outer packaging: <ul style="list-style-type: none"> <li>• 300 g or ml to 1000 g or ml</li> </ul>
Maximum number of packages	No limits	1000 units
Marking	Limited Quantity Mark <i>(*For air transport, the mark requires an additional "Y" which indicates compliance with ICAO TI)</i>	Excepted Quantity Mark

7. Only selected dangerous goods can be transported in limited quantities (LQ) or excepted quantities (EQ), indicated in columns 7a and 7b of the Dangerous Goods List respectively. A number in column 7a indicates the maximum quantity of dangerous goods per inner packaging. An alphanumeric code in column 7b specifies the maximum quantity of dangerous goods per inner packaging and outer packaging.

8. A table extracted from the *Guiding Principles for the Development of the UN Model Regulations* presented in Annex 1 of this paper indicates the limited and excepted quantities values corresponding to the class and packing group.

9. The following table illustrates examples of Class 3 dangerous goods, UN Nos. 1106, 1107 and 1184, with their respective LQ and EQ values as indicated in the Dangerous Goods List. Next, UN Nos. 1204, 1305 and 2059 are not allowed to be transported as excepted quantities (E0). The quantities are consistent with the criteria and exemptions described in the *Guiding Principles for the Development of the UN Model Regulations* (Annex).

UN No	Name and description	Class or Division (subsidiary hazard)	Packing Group	LQ	EQ
1106	AMYLAMINE	3 (8)	II	1 L	E2
1107	AMYL CHLORIDE	3	II	1 L	E2
1184	ETHYLENE DICHLORIDE	3 (6.1)	II	1 L	E2
1204	NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin	3	II	1 L	E0
1305	VINYLTRICHOLOSILANE	3 (8)	II	0	E0
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose	3	II	1 L	E0
(...)					

10. The following table illustrates examples of Class 3 dangerous goods, UN Nos. 1228, 1261 and 1278 with their respective LQ and EQ values as indicated in the Dangerous Goods List. These dangerous goods are not allowed to be transported as excepted quantities (E0). These restrictions are not consistent with the criteria described in the *Guiding Principles for the Development of the UN Model Regulations* (Annex).

UN No	Name and description	Class or Division (subsidiary hazard)	Packing Group	LQ	EQ
1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3 (6.1)	II	1 L	E0
1261	NITROMETHANE	3	II	1 L	E0
1278	1-CHLOROPROPANE	3	II	1 L	E0
(...)					

## Current challenges

11. The expert from Canada would like to draw the attention of the Sub-Committee to this last table (UN Nos. 1228, 1261 and 1278). Without detailed information on the constraints of the EQ provisions and quantities, it is difficult to comprehend why UN entries such as 1228, 1261 and 1278 with packing group II can be transported as limited quantities, packed in quantities of up to 1 L per inner packaging, contained in non-UN standardized packagings, and without a limit in the number of packages transported. Yet, the same dangerous goods cannot be transported in much smaller quantities covered under EQ, contained in stronger and tested packagings.

12. It is our experience that these discrepancies are not easily understood by shippers and those who are involved with the oversight of the transportation of dangerous goods, mainly regulators, inspectors and instructors whose tasks involve writing, enforcing and teaching the regulations.

13. The expert from Canada believes that clarification on Chapter 3.4 and Chapter 3.5 is deemed necessary and invites members of the Sub-Committee to address the following questions:

(a) Should there be a correlation between the limited and excepted quantities schemes?

(b) Wouldn't it be reasonable to allow dangerous goods accepted as limited quantities to be transported as excepted quantities, considering the smaller quantities and more stringent packing requirements under the Excepted Quantities Provisions?

(c) Would a clarification in the *Guiding Principles for the Development of the UN Model Regulations* reflecting the rationale be supported by the Sub-Committee?

14. Should the Sub-Committee have interest in addressing these questions and exploring in depth this topic, the expert from Canada gladly offers to lead the discussion.

## Annex

## Comparative table of maximum quantities

Class/ Division	Packing Group I		Packing Group II		Packing Group III	
	LQ	EQ	LQ	EQ	LQ	EQ
1	Not permitted in LQ and EQ					
2.1	Not permitted in LQ and EQ					
2.2 (without subsidiary risk) <sup>a</sup>	LQ: 120 ml EQ: E1 (30/1000) <sup>*</sup>					
2.2 (with subsidiary risk)	Not permitted in LQ and EQ					
2.3	Not permitted in LQ and EQ					
3 (without subsidiary risk) <sup>b</sup>	0	E3 (30/300) <sup>*</sup>	1 L	E2 (30/500) <sup>*</sup>	5 L	E1 (30/1000) <sup>*</sup>
3 (with subsidiary risk) <sup>c</sup>	0	E0 (Not permitted)	1 L	E2 (30/500) <sup>*</sup>	5 L	E1 (30/1000) <sup>*</sup>
4.1 <sup>d</sup>	0	E0 (Not permitted)	1 kg	E2 (30/500) <sup>*</sup>	5 kg	E1 (30/1000) <sup>*</sup>
4.2	0	E0 (Not permitted)	0	E2 (30/500) <sup>*</sup>	0	E1 (30/1000) <sup>*</sup>
4.3	0	E0 (Not permitted)	500 g or ml	E2 (30/500) <sup>*</sup>	1 kg or L	E1 (30/1000) <sup>*</sup>
5.1	0	E0 (Not permitted)	1 kg or L	E2 (30/500) <sup>*</sup>	5 kg or L	E1 (30/1000) <sup>*</sup>
5.2 <sup>e</sup>	LQ: Types B or C: 25 ml – 100 g LQ: Types D, E, or F: 125 ml – 500 g Not permitted in EQ					
6.1 <sup>f, g</sup>	0	E0 for toxic by inhalation <sup>k</sup> E5 for other substances	100 ml (liquid) or 500 g (solid)	E4 (1/500) <sup>*</sup>	5 kg or L	E1 (30/1000) <sup>*</sup>
6.2	Not permitted in LQ and EQ					
7	Not permitted in LQ and EQ					
8 <sup>h, i</sup>	0	E0 (Not permitted)	1 kg or L	E2 (30/500) <sup>*</sup>	5 kg or L	E1 (30/1000) <sup>*</sup>
9 <sup>j</sup>	0	Not Applicable	1 kg or L	E2 (30/500) <sup>*</sup>	5 kg or L	E1 (30/1000) <sup>*</sup>

<sup>\*</sup> The alphanumeric codes indicate the maximum quantity of dangerous good per inner packaging in g or ml/ maximum quantity of dangerous goods per outer packaging in g or ml.

The following are exemptions to the criteria for excepted quantities:

<sup>a</sup> For gases, the volume indicated for inner packagings refers to the water capacity of the inner receptacle and the volume indicated for outer packagings refers to the combined water capacity of all inner packagings within a single outer package;

<sup>b</sup> Desensitized explosives and UN 3256 shall not be transported as excepted quantities;

<sup>c</sup> Chlorosilanes (UN Nos. 1162, 1196, 1250, 1298, 1305, 2985) shall not be transported as excepted quantities.

<sup>d</sup> Self-reactive substances, polymerizing substances, desensitized explosives, UN Nos. 2304, 2448, 3176 (molten substances), 3360 and 3527 shall not be transported as excepted quantities;

- e* Division 5.2 dangerous goods shall **ONLY** be transported as excepted quantities if in UN3316, Chemical Kit or First Aid Kit;
- f* UN Nos. 1600, 2312 and 3250 (molten substances) shall not be transported as excepted quantities;
- g* Chlorosilanes (UN Nos. 3361, 3362) shall not be transported as excepted quantities.
- h* UN Nos. 2215 (molten), 2576, 2803 and 2809 shall not be transported as excepted quantities;
- i* Chlorosilanes (UN Nos. 1724, 1728, 1747, 1753, 1762, 1763, 1766, 1767, 1769, 1771, 1781, 1784, 1799, 1800, 1801, 1804, 1816, 1818, 2434, 2435, 2437, 2986, 2987) shall not be transported as excepted quantities.
- j* Code E1 applies for UN Nos. 3334 and 3335. UN Nos. 1845, 2807, 3245, 3257 and 3258 shall not be transported as excepted quantities;
- k* These are substances which are assigned Special Provision 354 in column (6) of the Dangerous Goods List and "TOXIC BY INHALATION" N.O.S entries.
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