

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

Sub-Committee of Experts on the Transport of Dangerous Goods

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Item 2 (b) of the provisional agenda

**Recommendations made by the Sub-Committee on
its forty-seventh, forty-eighth and
forty-ninth sessions and pending issues:
explosives and related matters**

Transport of energetic samples for further testing – supplementary information and modified proposal of ST/SG/AC.10/C.3/2016/61

Transmitted by the European Chemical Industry Council (CEFIC)

Introduction

1. In working document ST/SG/AC.10/C.3/2016/61, CEFIC proposed new provisions for the transport of energetic samples. An essential feature was the introduction of specific packagings for that purpose.
2. Since testing was not fully completed at the time of submission of the formal proposal, some technical details were missing which are described in this informal paper. Further, thanks to early feedback obtained by some authorities, the aforementioned proposal is slightly modified for purposes of clarification.

Proposal

3. For the sake of readability, the proposal of paper 2016/61 is reproduced here completely. New text is written in bold, deleted text is struck through.
4. Create a new section 2.0.4.3 to read
“2.0.4.3 **Samples of energetic materials**
2.0.4.3.1 **Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.2 in Annex 6 (Screening Procedures) of the Manual of Tests and Criteria may be transported under UN 3224 (solid self-reactive substances) or UN 3223 (liquid self-reactive substances), as applicable, of Division 4.1 provided that:**

(a) The samples do not contain any known explosives or compounds designed with the view of producing a practical explosive or pyrotechnic effect. This restriction also applies to samples consisting of synthetic precursors of intentional explosives;

(b) For mixtures, complexes or salts of inorganic oxidizing substances of Division 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:

- Less than 15%, by mass, if assigned to packing group I (high hazard) or II (medium hazard);
- Less than 30%, by mass, if assigned to packing group III (low hazard);

(c) Available data do not allow a more precise classification; and

(d) The sample is not packed together with other goods.

The sample is packaged in accordance with special packing provision PP94 or PP95, as applicable.

If solids and liquids are contained within one package, UN 3223 shall be used.”

5. In the Dangerous Goods List, add PP94 and PP95 in column 9 for UN No. 3223 and 3224 to read

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

6. In packing instruction P520, add a new special packing provision PP94 as follows:

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

1. Only combination packagings with outer packagings comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are used;
2. The samples are carried in microtiter plates or multi-titer plates made of plastic, glass, porcelain or stoneware as inner packagings;
3. The maximum amount per individual inner cavity does not exceed 0.01 g for solids or 0.01 ml for liquids;
4. The maximum net quantity per outer packaging is 20 grams for solids or 20 ml for liquids, or sum of grams and ml in the case of mixed packing; and
5. ~~Packing method OP2 is applied; and~~
6. When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports

shall be provided to secure the secondary packagings in the original position. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.”

7. In packing instruction P520, add a new special packing provision PP95 as follows:
- “PP95 Small amounts of energetic samples of section 2.0.4.3 may be carried under UN 3223 or 3224, as applicable, provided that:
1. Outer packagings comprise only type 4G having dimensions of **60 cm (l) by 40,5 cm (w) by 30 cm (h) and wall thickness of 1,3 cm consisting of corrugated cardboard;**
 2. The individual substance is contained in an inner packaging of glass or plastic of maximum capacity 30 ml placed in an **EPE (Expandable Polyethylene)** foam matrix of **130 mm strength** having a density of **17-19 g/liter;**
 3. **Within the foam carrier, sample receptacles** are segregated from each other **by a distance of 40 mm** ~~foam layer of (xx) mm thickness~~ and from the wall of the outer package by a distance of 70 mm ~~foam layer of (yy) mm thickness~~. **The package may contain up to two layers of such foam matrices, each carrying 28 sample bottles.**
 4. The maximum content of each inner receptacle does not exceed 1 g for solids or 1 ml for liquids;
 5. The maximum net quantity per outer packaging is **56 grams** for solids or **56 ml** for liquids, or sum of grams and ml in the case of mixed packing;
 6. ~~Packing method OP2 is applied; and~~
 7. When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports shall be provided to secure the secondary packagings in the original position. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.”

Justification

8. Test reports were essentially already given in working paper 2016/61. For completeness, tests were also performed with two layers of foam carrying samples. Receptacles containing dry picric acid were placed horizontally and vertically in the vicinity of the initiating charge.

9. Apart from cracked glass bottles in the upper layer and a fracture in the lower layer glass bottle, no critical effects were found. An initiation of the picric acid was not observed. The outer package remained totally intact and showed no exterior effects.

Figure 1: Upper (left) and lower (right) foam layer after test

