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**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

Thirty-first session  
Geneva, 2-6 July 2007  
Item 3 of the provisional agenda

**LISTING, CLASSIFICATION AND PACKING**

Amendments to the UN Firework Classification Table – Table 2.1.3.5.3

Transmitted by the expert from the United Kingdom

**Introduction**

1. At the 30<sup>th</sup> session the definition of flash composition in Note 2 to 2.1.3.5.5 was adopted. This change of definition required changes to Table 2.1.3.5.3 to amend references to flash composition in the "specifications" column. The revised changes can be found in the annex to this document (Bold text means new addition and strikethrough means deleted text).
2. The United Kingdom firework industry has noticed a common type of firework, a "Comet", has been omitted from Table 2.1.3.5.5. This firework type has one pyrotechnic effect per tube and tube sizes greater than 30mm. Comet fireworks are larger than the "shot tubes" and does not fall into the category of "shell in mortar". As the firework compositions are similar to those found in Roman candles the United Kingdom expert proposes to use this specification to set the limits for 1.1G, 1.2G and 1.3G entries.

3. The United Kingdom have been carrying out further research to improve the ignition system and reduce the standard deviation of the results of the time/pressure test for the determination of flash composition and a review of the cut off value for flash composition. This research is still being carried out but the expert from the United Kingdom will be submitting an information paper on this work to the July meeting

### Proposal

4. To insert the following entry for Comet fireworks into Table 2.1.3.5.5.

Type	Includes: / Synonym:	Definition	Specification	Classification
Comet	Comet tail, splitting comets, Crossette stars	tube containing a pyrotechnic unit consisting of pyrotechnic composition, propellant charge, with or without transmitting fuse	$\geq 50$ mm inner diameter, >25% flash composition	1.1G
			$\geq 50$ mm inner diameter, containing no flash composition	1.2G
			>30 mm < 50 mm inner diameter, flash composition $\leq 25\%$	1.3G

## Annex

### 2.1.3.5 Assignment of fireworks to hazard divisions

2.1.3.5.1 Fireworks shall normally be assigned to hazard divisions 1.1, 1.2, 1.3, and 1.4 on the basis of test data derived from Test Series 6. However, since the range of such articles is very extensive and the availability of test facilities may be limited, assignment to hazard divisions may also be made in accordance with the procedure in 2.1.3.5.2.

2.1.3.5.2 Assignment of fireworks to UN Nos. 0333, 0334, 0335 or 0336 may be made on the basis of analogy, without the need for Test Series 6 testing, in accordance with the default fireworks classification table in 2.1.3.5.5. Such assignment shall be made with the agreement of the competent authority. Items not specified in the table shall be classified on the basis of test data derived from Test Series 6.

**NOTE 1:** *The addition of other types of fireworks to column 1 of the table in 2.1.3.5.7 should only be made on the basis of full test data submitted to the UN Sub-Committee on the Transport of Dangerous Goods for consideration.*

**NOTE 2:** *Test data derived by competent authorities which validates, or contradicts the assignment of Hazard Division to fireworks specified in column 4 of the table in 2.1.3.5.5 to hazard divisions in column 5 should be submitted to the UN Sub-Committee on the Transport of Dangerous Goods for information (see also note 3 in 2.1.3.2.3).*

2.1.3.5.3 Where fireworks of more than one hazard division are packed in the same package they shall be classified on the basis of the highest hazard division unless test data derived from Test Series 6 indicate otherwise.

2.1.3.5.4 The classification shown in the table in 2.1.3.5.5 applies only for articles packed in fibreboard boxes (4G).

2.1.3.5.5 Default fireworks classification table<sup>11</sup>

**NOTE 1:** *References to percentages in the table, unless otherwise stated, are to the mass of all pyrotechnic composition (e.g. rocket motors, lifting charge, bursting charge and effect charge).*

**NOTE 2:** *"Flash composition" in this table refers to pyrotechnic compositions in powder form or as pyrotechnic units as presented in the fireworks, that are used to produce an aural effect, or are used as a bursting charge or a lifting charge, unless the time taken for the pressure rise is demonstrated to be more than 8 ms for 0,5 g of pyrotechnic composition in Test series 2(c)(i) "Time/pressure test".*

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<sup>1</sup> This table contains a list of firework classifications that may be used in the absence of Test Series 6 data (see 2.1.3.5.2).

**NOTE 3:** *Dimensions in mm refer to:*

- *for spherical and peanut shells the diameter of the sphere of the shell;*
- *for cylinder shells the length of the shell;*
- *for a shell in mortar, Roman candle, shot tube firework or mine the inside diameter of the tube comprising or containing the firework;*
- *for a bag mine or cylinder mine, the inside diameter of the mortar intended to contain the mine.*

Type	Includes: / Synonym:	Definition	Specification	Classification
Shell, spherical or cylindrical	spherical display shell: aerial shell, colour shell, dye shell, multi-break shell, multi-effect shell, nautical shell, parachute shell, smoke shell, star shell; report shell: maroon, salute, sound shell, thunderclap, aerial shell kit	device with or without propellant charge, with delay fuse and bursting charge, pyrotechnic unit(s) or loose pyrotechnic composition and designed to be projected from a mortar	all report shells	1.1G
			colour shell: $\geq 180$ mm	1.1G
			colour shell: $< 180$ mm, <b>flash composition</b> $> 25\%$ ( <del>with <math>&gt; 25\%</math> flash composition, as loose powder and/ or report effects</del> )	1.1G
			colour shell: $< 180$ mm, <b>flash composition</b> $\leq 25\%$ ( <del>with <math>\leq 25\%</math> flash composition, as loose powder and/ or report effects</del> )	1.3G
			colour shell: $\leq 50$ mm, or $\leq 60$ g pyrotechnic composition <b>and flash composition</b> $\leq 2\%$ ( <del>with <math>\leq 2\%</math> flash composition as loose powder and/ or report effects</del> )	1.4G
peanut shell	device with two or more spherical aerial shells in a common wrapper propelled by the same propellant charge with separate external delay fuses	the most hazardous spherical aerial shell determines the classification		
preloaded mortar, shell in mortar	assembly comprising a spherical or cylindrical shell inside a mortar from which the shell is designed to be projected	all report shells	1.1G	
		colour shell: $\geq 180$ mm	1.1G	
		<b>colour shell: flash composition</b> $> 25\%$ *	<b>1.1G</b>	
		colour shell: $> 50$ mm and $< 180$ mm, <b>flash composition</b> $> 25\%$	<b>1.1G</b>	
colour shell: $> 50$ mm and $< 180$ mm, <b>flash composition</b> $\leq 25\%$	1.2G			

\* *Note by the secretariat: In the 15<sup>th</sup> revised edition of the UN Recommendations on the Transport of Dangerous goods, this entry reads “colour shell:  $> 25\%$  flash composition as loose powder and/or report effects”.*

Type	Includes: / Synonym:	Definition	Specification	Classification
			Colour shell: ≤ 50 mm, or ≤ 60 g pyrotechnic composition, flash composition ≤ 25% ( <del>with ≤ 25% flash composition as loose powder and/or report effects</del> )	1.3G
	shell of shells (spherical) (Reference to percentages for shell of shells are to the gross mass of the fireworks article)	device without propellant charge, with delay fuse and bursting charge, containing report shells and inert materials and designed to be projected from a mortar	> 120 mm	1.1G
		device without propellant charge, with delay fuse and <b>black powder</b> bursting charge, containing report units ( <del>≤ 25g flash composition per report unit, with ≤ 33% flash composition and ≥ 60% inert materials</del> ) and designed to be projected from a mortar. <b>Each report unit ≤ 25g flash composition. The net explosive content shall not exceed 45% of the gross mass of the device.</b>	≤ 120 mm	1.3G
		device without propellant charge, with delay fuse and bursting charge, containing colour shells and/or pyrotechnic units and designed to be projected from a mortar	> 300 mm	1.1G

Type	Includes: / Synonym:	Definition	Specification	Classification
		device without propellant charge, with delay fuse, bursting charge, ≤ 70mm colour shells and/or pyrotechnic units, ( <del>with ≤ 25% flash composition and ≤ 60% pyrotechnic composition</del> ) and designed to be projected from a mortar, <b>The net explosive content of the device shall not exceed 60% of the gross mass of the device. Flash composition ≤ 65% of the net explosives content.</b>	> 200 mm and ≤ 300 mm	1.3G
		device with a propellant charge, with delay fuse, bursting charge, ≤ 70mm colour shells and/or pyrotechnic units, ( <del>with ≤ 25% flash composition and ≤ 60% pyrotechnic composition</del> ) and designed to be projected from a mortar, <b>The net explosive content of the device shall not exceed 60% of the gross mass of the device. Flash composition ≤ 65% of the net explosives content.</b>	≤ 200 mm	1.3G
Battery/ combination	barrage, bombardos, cakes, finale box, flowerbed, hybrid, multiple tubes, shell cakes, banger batteries, flash banger batteries	assembly including several elements either containing the same type or several types each corresponding to one of the types of fireworks listed in this table, with one or two points of ignition	the most hazardous firework type determines the classification	
Roman candle	exhibition candle, candle, bombettes	tube containing a series of pyrotechnic units consisting of alternate	≥ 50 mm inner diameter, >25% flash composition	1.1G

Type	Includes: / Synonym:	Definition	Specification	Classification
		pyrotechnic composition, propellant charge, and transmitting fuse	≥ 50 mm inner diameter, containing no flash composition	1.2G
			< 50 mm inner diameter and ≤ 25% flash composition	1.3G
			≤ 30 mm. inner diameter, flash composition ≤ 5% and each pyrotechnic unit ≤ 25 g	1.4G
Shot tube	single shot Roman candle, small preloaded mortar	tube containing a pyrotechnic unit consisting of pyrotechnic composition, propellant charge with or without transmitting fuse	≤ 30 mm inner diameter and pyrotechnic unit > 25 g, or > 5% and ≤ 25% flash composition	1.3G
			≤ 30 mm inner diameter, pyrotechnic unit ≤ 25 g and ≤ 5% flash composition	1.4G
Rocket	avalanche rocket, signal rocket, whistling rocket, bottle rocket, sky rocket, missile type rocket, table rocket	tube containing pyrotechnic composition and/or pyrotechnic units, equipped with stick(s) or other means for stabilization of flight, and designed to be propelled into the air	Flash composition effects only	1.1G
			Flash composition > 25%	1.1G
			> 20 g pyrotechnic composition and flash composition ≤ 25%	1.3G
			≤ 20 g pyrotechnic composition, black powder bursting charge and <b>flash composition ≤ 1 g and ≤ 0.13 g per report (≤ 0.13 g flash composition per report and ≤ 1 g in total)</b>	1.4G
Mine	pot-a-feu, ground mine, bag mine, cylinder mine	tube containing propellant charge and pyrotechnic units and designed to be placed on the ground or to be fixed in the ground. The principal effect is ejection of all the pyrotechnic units in a single burst producing a widely	flash composition > 25% ( <del>as loose powder and/ or report effects</del> )	1.1G
			≥ 180mm and flash composition ≤ 25% ( <del>as loose powder and/ or report effects</del> )	1.1G
			< 180mm and flash composition ≤ 25% ( <del>as loose powder and/ or report effects</del> )	1.3G



Type	Includes: / Synonym:	Definition	Specification	Classification
		dispersed visual and/or aural effect in the air; or cloth or paper bag or cloth or paper cylinder containing propellant charge and pyrotechnic units, designed to be placed in a mortar and to function as a mine	≤ 150g pyrotechnic composition, flash composition ≤ 5%. <del>(as loose powder and/or report effects)</del> . Each pyrotechnic unit ≤ 25 g, each report effect < 2g ; each whistle, if any, ≤ 3 g	1.4G
Fountain	volcanos, gerbs, showers, lances, Bengal fire, flutter sparkle, cylindrical fountains, cone fountains, illuminating torch	non-metallic case containing pressed or consolidated sparks and flame producing pyrotechnic composition	≥ 1 kg pyrotechnic composition, <b>no flash composition</b>	1.3G
			< 1 kg pyrotechnic composition, <b>no flash composition</b>	1.4G
Sparkler	handheld sparklers, non-handheld sparklers, wire sparklers	rigid wire partially coated (along one end) with slow burning pyrotechnic composition with or without an ignition tip	perchlorate based sparklers: > 5 g per item or > 10 items per pack	1.3G
			perchlorate based sparklers: ≤ 5 g per item and ≤ 10 items per pack; nitrate based sparklers: ≤ 30 g per item	1.4G
Bengal stick	dipped stick	non-metallic stick partially coated (along one end) with slow-burning pyrotechnic composition and designed to be held in the hand	perchlorate based items: > 5 g per item or > 10 items per pack	1.3 G
			perchlorate based items: ≤ 5 g per item and ≤ 10 items per pack; nitrate based items: ≤ 30 g per item	1.4G
Low hazard fireworks and novelties	table bombs, throwdowns, crackling granules, smokes, fog, snakes, glow worm, serpents, snaps, party poppers	device designed to produce very limited visible and/ or audible effect which contains small amounts of pyrotechnic and/ or explosive composition	Throwdowns and snaps may contain up to 1.6 mg of silver fulminate; snaps and party poppers may contain up to 16 mg of potassium chlorate/ red phosphorous mixture; other articles may contain up to 5 g of pyrotechnic composition, but no flash composition	1.4G

Type	Includes: / Synonym:	Definition	Specification	Classification
Spinner	aerial spinner, helicopter, chaser, ground spinner	non-metallic tube or tubes containing gas- or spark-producing pyrotechnic composition, with or without noise producing composition, with or without aerofoils attached	pyrotechnic composition per item > 20 g, containing ≤ 3% flash composition as report effects, or consolidated whistle composition ≤ 5 g	1.3G
			pyrotechnic composition per item ≤ 20 g, containing ≤ 3% flash composition as report effects, or <b>consolidated</b> whistle composition ≤ 5 g	1.4G
Wheels	Catherine wheels, Saxon	assembly including drivers containing pyrotechnic composition and provided with a means of attaching it to a support so that it can rotate	≥ 1 kg total pyrotechnic composition, no report effect, each whistle (if any) ≤ 25 g and ≤ 50 g <b>consolidated</b> whistle composition per wheel	1.3G
			< 1 kg total pyrotechnic composition, no report effect, each whistle (if any) ≤ 5 g, and ≤ 10 g <b>consolidated</b> whistle composition per wheel	1.4G
Aerial wheel	flying Saxon, UFO's, rising crown	tubes containing propellant charges and sparks- flame- and/ or noise producing pyrotechnic compositions, the tubes being fixed to a supporting ring	> 200 g total pyrotechnic composition or > 60 g pyrotechnic composition per driver, ≤ 3% flash composition as report effects, each whistle (if any) ≤ 25 g, and ≤ 50 g <b>consolidated</b> whistle composition per wheel	1.3G
			≤ 200 g total pyrotechnic composition and ≤ 60 g pyrotechnic composition per driver, ≤ 3% flash composition as report effects, each whistle (if any) ≤ 5 g, and ≤ 10 g <b>consolidated</b> whistle composition per wheel	1.4G
Selection pack	display selection box, display selection pack, garden selection box, indoor selection box; assortment	A pack of more than one type each corresponding to one of the types of fireworks listed in this table	The most hazardous firework type determines the classification	

<b>Type</b>	<b>Includes: / Synonym:</b>	<b>Definition</b>	<b>Specification</b>	<b>Classification</b>
Firecracker	celebration cracker, celebration roll, string cracker	assembly of tubes (paper or cardboard) linked by a pyrotechnic fuse, each tube intended to produce an aural effect	each tube $\leq$ 140 mg of flash composition or $\leq$ 1 g black powder	1.4G
Banger	salute, flash banger, lady cracker	non-metallic tube containing report composition intended to produce an aural effect	$>$ 2 g flash composition per item	1.1G
			$\leq$ 2 g flash composition per item and $\leq$ 10 g per inner packaging	1.3G
			$\leq$ 1 g flash composition per item and $\leq$ 10 g per inner packaging or $\leq$ 10 g black powder per item	1.4G