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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
(Twenty-third session, 30 June -4 July 2003, agenda item 3 (a))

EXPLOSIVES, SELF-REACTIVE SUBSTANCES AND ORGANIC PEROXIDES

Default system for classification of fireworks

Transmitted by the expert from the United States of America

Background

1. During the previous biennium the Sub-Committee was unable to reach an agreement on a default system for classification of fireworks. The expert from the United States of America did not support the results presented to the Sub-committee by the working group because it was incomplete and deviated from the original intent of the Sub-Committee but is interested in continuing the work of developing a practical default system that covers a broad range of commercial fireworks. The expert from the United States of America considers this is a worthwhile task and requested the Committee to include this item in the work program of the 2003-2004 biennium. On this basis, we are submitting this proposal for consideration by the Sub-Committee

Introduction

2. In this proposal we present a default system which takes into account the following points:

(1) Fireworks are Class 1 articles and classification of fireworks shall be in accordance with the classification requirements for explosives in the UN Model of Regulations. Recognizing that it is not always practical to test large numbers of fireworks, the United States of America and other countries have utilized a “default (or no testing) system” as the alternate path to classify fireworks.

(2) Fireworks are intentionally designed to produce pyrotechnic effects (showers of sparks, color, noise, light etc.) for entertainment purposes. It is generally recognized that most fireworks, even containing small quantity of pyrotechnic composition, will fail the criteria of 1.4G because they will produce fiery projections flying over a distance of 15 meters from the edge of the packages being tested. It is also recognized that certain firework items will meet the criteria of 1.1G because of their size or nature of their pyrotechnic composition.

(3) The default system proposed here is based on years of experience practiced in many countries where certain criteria for classification of explosives are not followed. It uses a bottom up approach where limits and criteria for 1.4G are defined first followed by criteria for 1.3G and 1.1G as appropriate. The proposed limits and criteria for 1.4G fireworks are very conservative because in many countries only 1.4G fireworks are authorized for use by the general public (consumers) to minimize the exposure risks. The limits and criteria for 1.3G and 1.1G fireworks are less restrictive because these items are to be used by professionally trained people and because the classification will impose specific operational requirements commensurate with the hazards posed by these fireworks.

(4) Essentially the default system would allow fireworks meeting the limits and criteria for 1.4G categories to be classified as 1.4G without testing even though when tested they produce fiery projections flying over a distance of 15 m. Safety analyses and practical experience gathered in the U.S. and other countries justify this practical approach. As for 1.3G and 1.1G categories of fireworks, years of experience gathered in many countries support the approach of classifying them without testing if they meet the limits and criteria specified in the default system.

(5) The criteria in the default system are based on the mass and composition of the pyrotechnic composition contained in the firework rather than the physical dimensions of the fireworks. The true hazard potentials of fireworks are reflected in terms of the mass and nature of the composition of the pyrotechnic composition in each firework device. Physical dimensions are a convenient measure for inspectors but not a good parameter to measure safety. It is understood that fireworks not meeting the limits and criteria set forth in the default table can always be classified based on results of UN Test Series 6 tests.

(6) The proposed default system contains most of the common categories of fireworks. It is intended to be a starting system where other categories can be added as deemed appropriate. Although it is the opinion of the expert from the U.S. that a list or set of definitions for the pyrotechnic composition is desirable for safety considerations we agree that it may not be practical to incorporate this level of detail into the UN Model Regulations.

3. The proposed default system takes into account safety concerns for transport, storage and use. It is developed for incorporation into both the UN Model Regulations and GHS document.

Proposal

4. A default system containing the most common categories of fireworks with mass and composition limits of the pyrotechnic composition are presented in the attached table for consideration by the Sub-committee to develop consensus opinions. Depending on the outcome of the discussion, the United States will amend this proposal to include all of the necessary amendments for incorporation into the UN Model Regulations.

5. The expert of the United States of America is prepared to host and sponsor an inter-sessional working group meeting to facilitate discussion of this subject if it is deemed necessary by the Sub-Committee.

Default Fireworks Table

Type	Includes:/Synonym	Description	Calibre/Weight	HD
Fountain	Cylindrical fountain, cone fountain, illuminating torch, flitter sparkler, volcanos, gerbs, showers, lances, Bengal fire.	Devices consist of a case (tube) containing pressed or consolidated sparks and/or flame producing pyrotechnic composition. May not have report effect.	Pyrotechnic composition not more than 100 grams per case (tube). When more than one case (tube) is mounted on a common base, the total pyrotechnic composition may not exceed 200 grams.	1.4G
			Pyrotechnic composition exceeds 100 grams per case (tube). For multiple-case (tubes) units the total pyrotechnic composition exceeds 200 grams per unit.	1.3G
Sparkler	Wire sparklers, dipped sticks, handheld sparklers, non-handheld sparklers.	Devices consist of a metal wire or thin stick coated with pyrotechnic composition to produce a shower of sparks. May not have report effect.	Pyrotechnic composition not more than 100 grams per device. Any sparkler containing a chlorate or perchlorate in its composition is limited to no more than 5 grams of pyrotechnic composition per device.	1.4G
			Pyrotechnic composition exceeds 100 grams per device.	1.3G
Wheel	Aerial wheels, ground wheels	Devices consist of drivers containing pyrotechnic composition to produce a shower of color, sparks and/or whistling effect. The device has a means of attaching it to a support so that it can rotate. May not have report effect.	Pyrotechnic composition not more than 60 grams per each driver and not more than 200 grams per wheel.	1.4G
			Pyrotechnic composition exceeds 60 grams per drive or exceeds 200 grams per wheel.	1.3G
Spinner	Aerial spinners, helicopters, ground spinners	Devices consist of a case (tube) containing gas- or spark-producing pyrotechnic composition, with or without noise producing composition, with or without aerofoils attached. A shower of sparks and color is produced by the rapid spinning device.	Pyrotechnic composition not more than 20 grams per device. Ground spinners may not have report effect. Aerial spinners and helicopters may contain report not more than 130 miligrams per report.	1.4G
			Pyrotechnic composition exceeds 20 grams per device. May contain report effect of more than 130 milligrams but not more than 50 grams per report. Total report composition is less than 20% of the total pyrotechnic composition.	1.3G

Type	Includes:/Synonym	Description	Calibre/Weight	HD
Rocket	Sky rocket, bottle rocket, missile type rocket, avalanche rocket, signal, table rocket	Devices consist of a case (tube) containing pyrotechnic composition designed to be propelled into the air, with or without a stick, with or without fins.	Pyrotechnic composition not more than 20 grams per device and report effect not more than 130 milligrams per report. Total report composition is less than 10 % of the total pyrotechnic composition.	1.4G
			Pyrotechnic composition exceeds 20 grams per device or report effect exceeds 130 milligrams but not more than 50 grams per report. Total report composition is less than 20% of the total pyrotechnic composition.	1.3G
Roman candle	Roman candle, exhibition candle, candle, bombetts	Devices consist of a tube containing pyrotechnic composition to propel stars into the air. May not have report effect.	Total pyrotechnic composition not more than 20 grams per device.	1.4G
			Total pyrotechnic composition exceeds 20 grams per device.	1.3G
Mine	Ground mine, ground shell devices, pot-a-feu	Devices consist of a tube containing pyrotechnic composition (lift charge, burst charge and visible/audible effect composition). The tube is attached to a solid base or designed to be placed or fixed in the ground to eject the internal components in a single burst producing a widely dispersed visual/aural effects in the air. The device shall not contain internal components containing bursting charge to burst open the component in the air. The device may contain more than 1 tube provided the tubes fire in sequence upon ignition of 1 external fuse.	60 grams of total pyrotechnic composition per device. For multiple-tube devices, the total pyrotechnic composition may not exceed 200 grams per device. The maximum quantity of lift charge in any one tube of a mine shall not exceed 20 grams and the maximum quantity of break or bursting charge in any tube shall not exceed 25% of the total weight of the pyrotechnic composition. The device may contain report with not more than 130 milligrams report effect per report.	1.4G
			Pyrotechnic composition exceeds 60 grams but not more than 7 Kg (approximately 250 mm in diameter) per tube or the report effect exceeds 130 milligrams per report but not more than 50 grams per report.	1.3G
			Pyrotechnic composition exceeds 7 Kg (approximately 250 mm in diameter) or the report effect exceeds 50 grams per report.	1.1G

Type	Includes:/Synonym	Description	Calibre/Weight	HD
Shell in launch tube	Color shell, multi-break shell, dye shell	Devices consist of a tube containing pyrotechnic composition (lift charge, burst charge and visible/audible effect composition) as an integral unit. The tube is attached to a wooden or plastic base to eject the internal components in a single burst producing a widely dispersed visual/aural effects in the air. The devise shall not contain internal component containing burst charge to burst open the component in the air. The device may contain more than 1 tube provided the tubes fire in sequence upon ignition of 1 external fuse.	Pyrotechnic composition not more than 60 grams per tube. For multiple tube devices (the tubes are fired in sequence with one external fuse), total pyrotechnic composition not more than 200 grams per device. The maximum quantity of lift charge in any tube may not contain more than 20 grams and the maximum quantity of break or bursting charge in any component shall not exceed 25% of the total pyrotechnic composition. The device may contain report with not more than 130 milligrams of report effect per report.	1.4 G
Aerial shell	Spherical or cylindrical display shell, aerial shell	Devices with or without propellant charge, with delay fuse and bursting charge, with pyrotechnic components or loose composition designed to be projected into the air from a mortar. Burst charge used in aerial shells is limited to black powder (potassium nitrate, sulfur, and charcoal) or similar pyrotechnic composition without metallic fuel.	Pyrotechnic composition exceeds 60 grams but not more than 7.0 Kg (approximately 7 inches in diameter) per device. The device may contain report with more than 130 milligrams but not more than 50 grams of report effect per report.	1.3G
			Pyrotechnic composition exceeds 7 Kg (approximately 250 mm in diameter) or the report effect exceeds 50 grams per report	1.1G
Firecracker		Devices consist of paper-wrapped or cardboard-tube containing report effect intended to produce noise and flash of light. A firecracker is a standing alone device and may not be in the form of unfinished component.	Each single tube of firecracker may contain not more than 50 milligrams of report effect. A devise may be a single tube or a string of multiple tubes (each tube contain not more than 50 milligrams of report effect) braided together with a primary so designed that each tube is functioned individually in sequence.	1.4G
Salute	Report shell	Devices consist of paper-wrapped or cardboard-tube or sphere containing explosive composition intended to produce noise and flash of light.	Report effect in each salute or in a salute component of a multi-effect shell may not exceed 70 grams.	1.3G
			Report effect in each salute or a salute component of a multi-effect shell exceeds 70 grams per salute.	1.1G