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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-sixth session, 29 November-3 December 2004  
Item 3 (c) of the provisional agenda

**OUTSTANDING ISSUES OR PROPOSALS OF AMENDMENTS TO THE RECOMMENDATIONS  
ON THE TRANSPORT OF DANGEROUS GOODS**

Explosives

Classification criteria for fireworks

Transmitted by the expert from the United Kingdom

**1. Introduction**

At the last meeting of the working group on explosives held during the 25th session (July 2004) the expert from the United Kingdom stated that he would be carrying out tests involving rockets with motors greater than 10g, and report compositions made from black powder and aluminium.

**2. Rockets**

A number of *ad hoc* tests were carried out on rockets with sticks which had rocket motors ranging from 10g to 100g. The tests showed when unconfined rockets were ignited, they travelled approximately 30m for the 10g rocket motor and over 60m for the 100g rocket motor. *Ad hoc* trials were carried out in a large wire mesh cage (8m × 8m), which is normally used for burning damaged or faulty fireworks. A single box of sticked rockets in a 4G fibreboard box was placed over a diesel fire at the centre of the wire mesh cage. The results showed that after the fibreboard box had been weakened by the fire, or by an explosion from a bursting charge, the rocket motors were sufficiently powerful to project the rockets against, or into, the mesh of the cage. Analysis of the debris showed that the rockets and their pyrotechnic effects would have travelled more than 15m. Following these tests it was decided not to carry out a full UN Test Series 6(c) trial on rockets.

The United Kingdom expert wishes to remove references to the rocket motor size as the classification criteria for 1.3G and 1.4G and revert to the original proposal by Germany for an overall limit of 20g nec. The table entry for rockets should be amended as follows:

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% of the pyrotechnic composition	1.1G
			>20g pyrotechnic composition and flash composition ≤ 25%	1.3G
			≤ 20g pyrotechnic composition; black powder bursting charge and ≤ 0.13 g flash composition per report and ≤ 1 g in total	1.4G

### 3. Flash Composition

The United Kingdom expert has been received a query from a United Kingdom fireworks importer concerning Note 2 to the default firework classification table - "*Flash composition*" in this table refers to *pyrotechnic compositions containing an oxidizing substance and a metal powder fuel that are used to produce an aural report effect or used as a bursting charge in fireworks devices*". The importer asked whether black powder and aluminium powder composition mixtures would be considered as flash composition. The United Kingdom expert has commissioned research comparing black powder/aluminium mixtures containing 4%, 6% and 8% aluminium powder with black powder, metal perchlorate/aluminium and metal nitrate/aluminium compositions commonly found in flash compositions in fireworks. The preliminary results indicate that the black powder/aluminium mixture showed overpressure values slightly less than those exhibited by barium nitrate/aluminium flash compositions (75/25%). However, there was no clear trend to increased overpressure with increasing proportions of aluminium. Research into black powder/aluminium mixtures is continuing and will be presented in a future informal paper.

### 4. Default fireworks classification table

Concerns have been expressed that the title of the table might not be fully understood by those whose first language is not English. The United Kingdom expert proposes that the title is followed by an asterisk and a note be added to the end of the table with the following text:

"\* 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)."

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