

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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Explosives and related matters: miscellaneous

Classification of Novelty Fireworks (snakes and sparklers)

Transmitted by the Dangerous Goods Advisory Council (DGAC)

Introduction

1. As already noted in a separate DGAC paper, the default fireworks classification table in 2.1.3.5.5 includes novelty fireworks within a row described as “Low hazard fireworks and novelties” assigned a 1.4G classification. Novelty fireworks also include snakes and sparklers. The purpose of this paper is to examine classification of these novelty items taking into account 6(c) testing and paragraph 2.1.3.6.4.
2. As with snappers and party poppers, snakes and sparklers are frequently transported separate from other fireworks and may be sold in retail outlets where other fireworks are not available (e.g., sparklers are frequently used at weddings). For this reason proper classification of these novelties takes on greater importance.
3. DGAC invites discussion on proper classification of these items by the Explosives Working Group in the light of bonfire test results and new paragraph 2.1.3.6.4.

Bonfire Testing

4. Bonfire testing on snakes and sparklers were carried out. Each packaging is illustrated as part of the bonfire testing videos DGAC will provide for the Subcommittee or the Explosive Working Group to view. They may also be viewed at <http://www.DGAC.org>.
5. A package containing snakes described as follows was subjected to bonfire testing:
snakes – pellets containing a maximum of 2 g pyrotechnic composition per device with a maximum of 20 devices per inner packagings and a maximum of 64 inner packagings per outer packaging.
The bonfire tests indicate that the tested snakes pose a hazard considerably below what might be expected of nondangerous goods (bags of corn chips were burned for comparison purposes).
6. A package containing "gold" sparklers described as follows was subjected to bonfire testing:
"gold" sparklers – containing a maximum of 30 grams of pyrotechnic composition per device, containing only nitrate oxidizers (and no perchlorate or chlorate oxidizers) with

a maximum of 5 devices per inner packaging and 288 inner packagings per outer packaging.

7. To illustrate the degree of hazard, a box of corn chips was burned for comparison. While the package containing sparklers burned with greater intensity for a short period and eventually self-extinguished, the corn chips burned for a period twice as long as the same size box of sparklers. There were no effects that would hinder fire fighting and the contents were not ejected from the package.

8. In our opinion the hazard demonstrated in the bonfire test is similar to that of a flammable solid and, in fact, flammable compositions are normally transported as Division 4.1 material. Burn rates were measured for "gold" sparklers from two manufacturers. The burn rates were 1.7 mm/sec (i.e., less than the 2.2 mm/sec needed for classification as a Division 4.1) and 2.7 mm/sec (i.e., regulated as a Division 4.1 substance). The measurements are conservative in that lower rates would be expected if testing had been carried out in accordance with the N.1 trough test normally used for Division 4.1 flammable solid classification. The tests indicate that the risk of these sparklers may be characterized as that of "borderline" Division 4.1 Packing Group III substances. DGAC invites discussion on whether these sparklers could be classified as Division 4.1 flammable solids.

Evaluation Under 2.1.3.6.4

9. The criteria in 2.1.3.6.4 were considered in relation to the novelty items described. In this respect DGAC would appreciate further clarification concerning two of the criteria. They are:

2.1.3.6.4(a) No external surface shall have a temperature of more than 65C. A momentary spike in temperature up to 200C is acceptable; and

2.1.3.6.4(d) No flash or flame capable of igniting a material such as a sheet of 80+ 10 g/m² paper in contact with the article.

Paragraph 2.1.3.6.4 indicates that the articles should be evaluated as individual items each activated by its own means of initiation. In the case of these novelties, the means of initiation is usually a match which is not included in packages of these items. Was it intended that these items be initiated using a match not included in the package? If so, what would be the basis for such consideration, noting that paper would meet these criteria? What would be the significance of these criteria for transport purposes, particularly after already demonstrating the degree of risk through bonfire testing?

Discussion

10. Based on the above evaluation, it is our opinion that the snakes tested could be transported as not subject to the regulations. In addition, it is our opinion that the sparklers tested should be classified on the basis of Division 4.1 flammable solids that could be transported as limited quantities of dangerous goods.

Proposal

11. Based on the above described tests and discussion, DGAC invites comments on the following proposals.

12. To provide for uniform international transport, DGAC proposes to except the described snakes from the regulations by amending the default classification table row addressing “Low hazard fireworks and novelties” by inserting the following additional text in the Specification column:

“Snakes containing not more than 2 g pyrotechnic composition per device with a maximum of 20 devices per inner packaging and 64 inner packagings per outer packaging are not subject to these regulations.”

13. Similarly for the above tested sparklers we propose:

“Sparklers containing only nitrate oxidizers (and no chlorate or perchlorate oxidizers) with a maximum of 30 grams of pyrotechnic composition per article and packaged with a maximum of 5 devices per inner packaging and 288 inner packagings per outer packaging may be transported under UN 3178, packing group III.”
