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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**
(Nineteenth session, 2-6 July 2001,
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EXPLOSIVES, SELF-REACTIVE SUBSTANCES AND ORGANIC PEROXIDES

Classification of fireworks

Proposal submitted by the expert of the Netherlands

Introduction

During the twenty first session of the Committee of Experts on the transport of dangerous goods an information paper submitted by the Netherlands (INF. 48) concerning the classification of fireworks was discussed (see report ST/SG/AC.10/27 par. 142-148).

Fireworks and firecrackers are manufactured according to national standards, which may differ from one country to another. These standards concern the quality and the use of the fireworks and firecrackers, but have no relation with the classification in divisions 1.1 to 1.4 in accordance with the UN Recommendations.

The Netherlands discussed this matter intersessionally in detail with experts from Norway, Sweden, the United Kingdom and China. On that basis the Netherlands come to the following recommendations.

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Classification

The causes of the accident in May 2000 in the Netherlands and the circumstances under which they took place are still under investigation. According to national regulations for storage, the storage of fireworks was only authorised for division 1.3G and 1.4. However it may be clear that the mass explosion could not have been caused by 1.3/1.4 fireworks alone.

In practice a lot of professional fireworks is transported by sea and imported in many countries as 1.4G.

Recent tests on the basis of test series 6 of the UN Recommendations show however that a lot of professional fireworks is at least of division 1.3 and some types are even of division 1.1. Especially the report shells (titanium salutes) turn out to be of division 1.1, although they have been transported by sea and imported in many countries, for example the Netherlands as 1.4G. This leads to the assumption that the classification of professional fireworks is not always correct and this is in our view also directly relevant to transport.

A summary of the test results until now can be found in the Annex of this proposal.

Test series 6 of the UN Recommendations

The test series 6 are in principle acceptable for the classification of fireworks. The problem is more that test series 6 are not used or only in a limited way to classify fireworks. In most cases the classification is based on analogy and not on the results of the test series 6 in accordance with the UN Recommendations.

During the investigations it became clear that the 6 (b) test is in some cases decisive for the classification of professional fireworks. In practice however this test is not frequently used. In our view further discussion is necessary on the status of the 6 (b) test.

A further result of the investigation of the accident and of the tests was, that fireworks classified as 1.3 loaded together with small amounts of division 1.1 can react almost at the same time e.g. as a mass explosion. This is covered in principle by the rule, that a transport unit should be labelled according to the most severe division. However it emphasises the importance of a correct classification!

Furthermore the behaviour of division 1.3 fireworks under certain circumstances, like confinement in a container needs to be investigated. It is recognised that such behaviour may not be covered by test series 6.

The descriptions as well as the interpretation of the test results in the test manual with respect to the classification of class 1 substances and articles and especially with respect to fireworks are not always clear. Special attention needs to be given to the current definition of mass explosion, since we feel that this definition originates from detonation reactions, whilst a mass explosion can also cover deflagration reactions.

Enforcement

Apart from regular inspections the Netherlands do not have any additional legal instrument, apart from the UN Recommendations, to check the containers with professional fireworks. No reclassification is required until now neither on the basis of transport regulation nor on the basis of storage regulations. In this respect it is noted that the enforcement of the correct classification of professional fireworks is very difficult. Only (very expensive) tests can confirm the correct classification. Furthermore test reports are often very difficult to obtain in practice. Another problem here is the diversity of the products.

Harmonisation

Many countries turn out to have an authorisation system for class 1 substances and articles. Part of the authorisation is the classification of Class 1 substances and articles (and especially of professional fireworks) by the competent authority of the country of import.

Although it is recognised that additional requirements may be needed for purposes other than transport (e.g. storage), we feel that the matter (like classification) is particularly relevant to transport and should also be regulated in the UN Recommendations in order to solve possible problems in a multimodal matter.

In the present situation requirements differ from one country to another, which is not desirable and contrary to the policy of harmonisation. Also in the light of the GHS discussion it should be clear how to deal with Class 1 substances and articles. A harmonisation in this field is also very important in order to improve the enforcement of the regulations.

Based on the above mentioned considerations the Netherlands recommend the following actions:

1. Use of fireworks

Fireworks and fireworks crackers are produced according to national standards of the countries of import. These standards deal with the quality of the fireworks, things like the fuse delay time and the packaging of fireworks. These requirements do not originate from transport regulations but from regulations concerning the use of fireworks e.g. consumer safety. Such standards often list forbidden substances, for example mercury. Sometimes also maximum amounts of pyrotechnic material are mentioned.

It is recognised, that standards differ from one country to another. It would be much better to develop standards which are accepted throughout the world. We feel that a harmonisation of the standards could improve the situation considerably. Especially the relation with the transport classification should be very clearly indicated in those standards. It is recommended, that standards on a worldwide basis, probably ISO standards should be developed. In order to do so it is necessary to develop first a categorisation in the different types of fireworks.

2. Transport and classification of fireworks

In our view the issue of classification of Class 1 fireworks concerns a safety issue and therefore the sub-committee should deal with this matter. In order to overcome the problems indicated it is necessary to develop a system based on the following principles:

- system should be based on test results of test series 6 of the UN Recommendations
- easy enforceable
- easy applicable
- uniform harmonised system
- not every article should be tested separately
- Interpretation of the test results should be clear.

A system which is based on a classification by default could be the solution. Current test results obtained with professional fireworks could serve as the basis to develop such a system. In the Annex of this proposal such a list, based on test results we have recently obtained, is presented. Other countries are encouraged to present their test results in order to extend the list. It may turn out to be necessary to perform additional tests in order to get a complete, clear and realistic list. Articles which are not on the list or not covered by the list should be tested in accordance with the Manual of Test and Criteria and a test report should be available. To facilitate easy transfer of test reports an agreement on format and minimum content of such a test report is encouraged.

In order to develop such a default system the Netherlands propose to install intersessionally a working group to develop a system for the transport classification of fireworks on the basis of the above mentioned principle.

Annex

Different kinds of fireworks and with different calibre have been tested and on that basis the table below is made. Test series 6(a), 6(b) and (6c) are performed.

This table should be regarded as a starting point and can be improved and completed if more test results are known. Other countries are invited to submit their experience with the classification of the listed and other fireworks articles in order to improve the list below.

Default classification means that the classification can be taken as indicated unless it can be proven that another division is correct.

Table 1: Example of default classification of fireworks articles

Name	Synonyms	Calibre (“)	Calibre (mm)	Default classification
report shell	(titanium) salute, (titanium) thunder, single salute titanium, maroon, final salute	all	all	1.1
colour shell	display shell, aerial shell, cylinder shell {colour} -peony, - chrysanthemum, - with pistil, willow, palm	≥ 8 < 8	≥ 200 < 200	1.1 1.3
cakebox with report as primary effect	finale box, {cakebox} - titanium salute, - titanium thunder	all	all	1.1
cakebox	flowerbed, battery, barrage, bombardos	all	all	1.3
Romans candle	exhibition candle	≥ 2 < 2	≥ 50 < 50	1.2 1.3
rockets		all	all	1.3
rockets with report as primary effect	avalanche rocket	all	all	1.1

- *This is a general overview, individual articles may behave differently.*
- *All articles containing report composition have a default classification 1.1.*
- *Articles containing a combination of colour and report effect, should be considered as report shells.*