

**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**
(Twentieth session, 3-12 December 2001,
agenda item 7 (d))

LISTING AND CLASSIFICATION

Miscellaneous amendment proposals (Parts 2 and 3)

Provisions for calcium hypochlorite in tablet form

Transmitted by the expert from South Africa

Background

South Africa and Germany submitted a joint proposal ST/SG/AC.10/C.2/2001/25/Corr 2 on provisions for calcium hypochlorite and trichloroisocyanuric acid, dry in tablet form which are wrapped individually are neither friable nor do contain particles less than 500 µm in diameter of more than 10 % (mass) of the total in that packaging.

Several hundred tons of calcium hypochlorite in tablet form, slotted into specialized chlorine dispensing units are manufactured and transported annually. The demand for the tablets in this form and packaging is that controlled dosing of chlorine can be achieved for low volume applications where an immediate but short term need has to be filled.

The same arguments for the subdued hazard characteristics shown by tablets compared to that of granules as stated in Document No. ST/SG/AC.10/C.3/2001/25/Corr 2 apply to this proposal. In addition, test results obtained on tablets by the South African Bureau of Standards are given in the attached Annex.

Classification

As for individually wrapped calcium hypochlorite tablets, the expert of South Africa is of the opinion that the current problem with the transportation of tablets packed in specialized dispensing units cannot be solved by establishing individual entries for calcium hypochlorite in a powder, granular or tablet form. Therefore a new special provision should be added to UN No's 1748, 2208 and 2880 to make provision for tablets between 70 and 350 grams per tablet which, according to the manufacturing process, are neither friable nor contain particles less than 500 µm in diameter of more than 10 % (by mass) of the total.

The South African calcium hypochlorite industry is, however, concerned that tablets slotted into dispensing cartridges can still pose a hazard during transport in case of fire. Therefore, it is our opinion that tablets so packed should be classified as Division 5.1 packing group III.

Proposals

1. Add packing group III to UN No's 1748, 2208 and 2880 to make provision for the classification of hypochlorite tablets that are not individually wrapped.

2. Add the following special provision yyy to UN No's 1748, 2208 and 2880:

“ Non-friable calcium hypochlorite tablets with a mass between 70 and 350 grams per tablet which are not individually packed and which are neither friable nor contain particles of less than 500 μ m in diameter of more than 10 % (by mass) of the total in that packaging, are classified as Division 5.1 packing group III.”

Annex

Samples of calcium hypochlorite granules and tablets were tested by the South African Bureau of Standards for reactivity when mixed with contaminants and for self-heating properties.

1. Reactivity when mixed with contaminants

Many substances are known for their incompatibility with calcium hypochlorite, but for the purpose of these tests five well-known “contaminants” were chosen. The first three, namely glycerine, brake fluid and anti-freeze, are considered to present the most extreme incompatibility with calcium hypochlorite. The other two substances, namely household oil and general purpose grease, were chosen due to their historical nomination as possible contaminants involving calcium hypochlorite by fire investigators.

Three drops of contaminant was added to about 6 g of granules and pieces of tablets with the same mass.

The following results were found:

Sample	Reaction time in seconds	
	Granules	Tablets*
Brake fluid	116	No reaction
Glycerine	0,07	No reaction
Anti-freeze	0,8	No reaction
Household oil	No reaction	No reaction
General purpose grease	No reaction	No reaction
* The tests were terminated after a 48 h period		

2 Self-heating properties

1,71 kg tablet containers, one filled with granular calcium hypochlorite and one filled with calcium hypochlorite tablets were exposed to a temperature of $48\text{ °C} \pm 0,5\text{ °C}$ in a laboratory oven for a period 12 h. The temperatures were monitored centrally inside the products.

Due to operational factors the time over which the test was conducted unfortunately had to be limited to a 12 h period. No effort was made to heat the samples to the point of combustion, and only the difference in inner temperature of the samples was measured. The choice of 48 °C was based upon the commonly accepted maximum ambient temperature that may be reached within a typical shipping container at sea.

The temperature development was as follows:

Sample	Temperature, °C at hourly intervals*												
	0	1	2	3	4	5	6	7	8	9	10	11	12
Tablets	21	35	41,6	43,8	45,1	45,7	45,9	45,8	46,0	46,3	46,4	46,5	46,9
Granules	21	44	47,8	47,8	48,5	48,6	48,5	48,2	48,0	48,3	48,2	48,2	48,6
* No reaction to the temperature was observed													