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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-first session, 1-10 July 2002,
agenda item 8 (d))

LISTING AND CLASSIFICATION

**Criteria for the corrosiveness of liquids and solids belonging to Class 8,
Packing Group III, for steel and aluminium**

Remarks on the proposal from the expert from Germany in document ST/SG/AC.10/C.3/2002/6

Transmitted by the expert from Austria

Problem I

1. Background

- 1.1 The first sentence of para. 2.8.2.2 of Chapter 2.8 of the UN Model Regulations on the Transport of Dangerous Goods as well as of the IMDG Code and the ICAO Technical Instructions reads as follows:

“Allocation of substances listed in the Dangerous Goods List in Chapter 3.2 to the packing groups in Class 8 has been made on the basis of experience taking into account such additional factors as inhalation risks (see 2.8.2.3) and reactivity with water (including the formation of dangerous composition products).”

1.2 In the IMDG Code the following text is found in 2.8.1.2.6:

“Many substances in this class only become corrosive after having reacted with water, or with moisture in the air. This fact is indicated in the Dangerous Goods List in Chapter 3.2 by the words “in the presence of moisture ...”. The reaction of water with many substances is accompanied by the liberation of irritating and corrosive Gases. Such gases usually become visible as fumes in the air.”

1.3 In the RID and ADR for the European land mode transport the above texts are missing, but one can find the following text in No. 2.2.8.1.1 second sentence:

“The heading of this Class covers other substances which form a corrosive liquid only in the presence of water, or which produce corrosive vapour or mist in the presence of natural moisture in the air.”

2. Discussion

2.1 The wording in the UN Recommendations, the IMDG Code and the ICAO Technical Instructions leads to the assumption that only (solid) substances already listed (by name ?) in the Dangerous Goods List in Chapter 3.2 are concerned by “reactivity with water” (“allocation ... has been made”); New and n.o.s. substances are not to be tested for these chemical properties.

2.2 The additional text in the IMDG Code leads to the assumption that solid substances have to be tested for the formation of irritating and corrosive gases.

The formation of irritating and corrosive gases is not covered by the criteria in the UN Recommendations.

2.3 In RID/ADR there is the general statement that Class 8 covers all substances that form corrosive liquids or produce corrosive vapours or mist with water or natural moisture in the air. This is far beyond the criteria of the UN Recommendations and the proposal from Germany covers in addition only (solid) substances which are hygroscopic.

2.4 The above mentioned differences are likely to lead to different classifications for the various modes of transport.

3. Proposal

3.1 The experts are asked to look for clarification as to whether

- (a) all solids should be tested for the forming of corrosive liquids with water;
- (b) only hygroscopic solids should be tested for the forming of corrosive liquids with water;
- (c) all solids should be tested for the production of corrosive gases / vapours / mist with water (and how);

- (d) only hygroscopic solids should be tested for the production of corrosive gases / vapours / mist with water (and how);
 - (e) all solids or only hygroscopic solids should be tested for the production of irritating gases / vapours / mist with water (and how).
- 3.2 It is suggested that an ad hoc working group should elaborate a text for the UN Recommendations on the results of the discussions which would be acceptable for all modes of transport.

Problem II

4. Background

- 4.1 The last words of the second but last sentence of 37.4.1.2 of the proposal (page 8, top) reads:

“corrosive medium shall have a minimum volume of 1,5 l to ensure enough reactive agent during the whole exposure time.”

- 4.2 This will work for most cases. But one will get different results when testing e.g. acids of low concentrations, especially when the testing period exceeds 168 hours, because as calculations show, e.g. a 0,1 normal solution (pH 1) of hydrochloric acid is depleted in less than 168 hours giving then negative results with the new test and positive results with the existing method. Thus very long testing periods without changing the solution will sometimes give negative results.

5. Proposal

- 5.1 To get correct results and to avoid re-testing of materials the following items of ASTM G 31 should be taken into the proposed text:

ASTM G31:

8.5.5: “...in such cases fresh solution must be provided during the course of the test”

8.9.1: “...the volume should be large enough to avoid any appreciable change in its corrosivity during the test!”

8.5.3: “...if problems are suspected the composition should be checked by analysis at the end of the test to determine the extent of change in composition, such as might result from evaporation or depletion”.

- 5.2 It is suggested that an ad hoc working group should decide whether and where appropriate texts may be inserted.
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