

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

19 June 2023

Sixty-second session

Geneva, 3-7 July 2023

Item 2(h) of the provisional agenda

Explosives and related matters: miscellaneous

Comments on ST/SG/AC.10/C.3/2023/19 on extending the entry for UN 3375 to provide for all packing groups

Submitted by the expert from Sweden

Introduction

1. In document ST/SG/AC.10/C.3/2023/19, the Australasian Explosives Industry Safety Group (AEISG) proposes to extend the entry for ammonium nitrate based emulsions (ANE), UN 3375, to also cover packing groups I and III. These emulsions (and the corresponding suspensions and gels) can currently only be assigned to packing group II.
2. The proposal from AEISG is to determine the appropriate packing group for an ANE based on the tests for oxidizing properties (O.1/O.3 for solids and O.2 for liquids). In document ST/SG/AC.10/C.3/2023/19 it is shown that the result of the tests performed consistently indicate packing group III or result in “not classified as oxidizing”. With the latter result, according to proposal from AEISG, packing group III will still be assigned.
3. To the expert from Sweden it appears that introducing the tests for oxidizing properties will, in practice, lead to a declassification of ANE from current packing group II to packing group III.

Discussion

4. ANE is essentially a mixture of ammonium nitrate (AN), which is an oxidizing substance, and fuel (usually an oil)¹. Like explosive mixtures in general, ANE is oxygen balanced (or closely so), meaning that the amount of oxidizer and fuel are matched to produce complete combustion (more or less). ANE is thus not an oxidizing mixture, and consequently it is not appropriate to use the classification tests for oxidizing properties to distinguish between packing groups for ANE, according to the expert from Sweden.
5. Based on the balanced proportions of oxidizer and fuel in ANE, the expert from Sweden doubts that any commercial ANE would meet the oxidizing criteria to be assigned to packing group I or II. The introduction of a test for oxidizing properties as proposed in document ST/SG/AC.10/C.3/2023/19 is thus very likely to, at least in the majority of cases, result in the assignment of packing group III to ANE. This is indeed also demonstrated in the document ST/SG/AC.10/C.3/2023/19 from AEISG.
6. AEISG also draws on the analogy with AN, which is assigned packing group III via the entries for UN 1942 and 2067 in the DGL. However, there are restrictions on the amount of combustible substances that AN is allowed to contain, to avoid a potentially explosive

¹ See special provision 309 to UN 3375, first sentence.

mixture of oxidizer and fuel (0.2% for pure AN²). ANE, on the contrary, is intended to function as an explosive (after being sensitized), and therefore contains a much higher proportion of fuel in relation to AN³. There is no reason *per se* that AN and ANE should be assigned the same packing group.

7. Finally, it could be noted in this context that solid AN-based fertilisers should be classified on basis of content and not on testing for oxidizing properties, see 2.5.2.1.2 in the Model Regulations and section 34.3.1 of the Manual of Tests and Criteria. The expert from Sweden believes that the situation is similar for ANE, and it could perhaps be considered to clarify this.

Conclusion

8. In summary, the expert from Sweden does not believe it is justified to assign packing groups to ANE based on the results from testing their oxidizing properties. The expert also does not find the analogy to AN to be relevant in assigning packing groups to ANE. For the reasons outlined in this document, the expert from Sweden cannot support the proposal in ST/SG/AC.10/C.3/2023/19.

² See the description of UN 1942 in the DGL and the classification flowchart in Section 39 of the MTC.

³ See special provision 309 to UN 3375 for typical compositions.