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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

Forty-fifth session
Geneva, 23 June – 2 July 2014
Item 4 (c) of the provisional agenda
Listing, classification and packing: miscellaneous

Packing requirements for UN1873

Transmitted by the Council on Safe Transportation of Hazardous Articles (COSTHA)[1]

Introduction

1. At the forty-third session, COSTHA presented in documents ST/SG/AC.10/C.3/2013/30 and informal document INF.5 arguments and test data supporting the compatibility of packagings constructed of plastic with high concentration perchloric acid. Comments received during the forty-third session were included in document ST/SG/AC.10/C.3/2013/64 which was presented at the forty-fourth session. Discussion during the forty-fourth session resulted in the creation of informal document INF.50 (44th session).

2. As a result of feedback received from the Sub-Committee at the forty-third session additional testing was conducted on fluorinated ethylene-propylene and specialty high density polyethylene bottles. The tests performed were consistent with ADR 6.1.5.2.5 and have been included as Annex 1 and Annex 2 to this document.

3. UN1873 is required to be packed in accordance with P502 and while P502 authorizes glass, plastic, and metal inner containers, special packing provision PP28 limits the construction of inner packagings and inner receptacles to glass for combination and composite packagings. Steel, aluminium and plastic single packagings are permitted for UN1873 up to a maximum capacity of 250 *l*.

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

4. The availability of high quality, low reaction plastics has increased since adoption of PP28. In particular, the use of fluoropolymers has resulted in very stable, chemically resistant packaging which would technically fall under the definition of plastic packaging. The current language in PP28 prohibits the use of these chemically stable and safe packagings.

5. Information on the incompatibility of perchloric acid with metals and organic matter is widely available.

Increased safety

6. Glass inner containers provide protection from chemical reactions for perchloric acid. However, physical hazards such as impacts and extreme temperatures can have a detrimental effect on glass. Plastic packaging provides greater flexibility in certain circumstances, being able to absorb hard impacts without shattering or cracking. Fluoropolymers in particular have been shown to provide long term flexibility without the embrittlement associated with other plastics. The results of the test report published as informal document INF.5 (43rd session) confirm these assertions.

Industry needs

7. UN1873 is used by industries such as geochemical and semiconductor for elemental analyses. Most elements in high purity perchloric acid used for elemental analyses are certified at concentrations as low as one part in 10^{12} (part per trillion). This level of purity cannot be maintained unless chemically pre-cleaned fluoropolymer containers are used. Glass and metal containers are unsuitable as they are incapable of maintaining purity at ppt levels.

Justification

8. Given the discussion above, COSTHA believes the special packing provision of PP28 is too restrictive and overly limits the use of safe and available packaging options. Paragraph 4.1.1.2 requires that packagings in direct contact with dangerous goods are constructed of materials that are compatible with those dangerous goods. It has been demonstrated that there are plastics available that are compatible with UN1873. Current options as outlined in 6.1.1.2 are limited to competent approvals or exemptions which may require multilateral agreements for international or intermodal transport.

Proposal

9. It has been demonstrated that there are plastics available that are compatible with UN1873. Although it has not been demonstrated that steel or aluminium is compatible with UN1873, there are commercially available metal packagings with interior coatings that make them a valid choice for transporting UN1873. To remain consistent with the wording in 4.1.1.2 and also ensure the known incompatibility of UN1873 with metal is addressed, while still allowing for the use of safe metal packagings, COSTHA suggests the current text of PP28 be replaced with the following text:

Current

PP28 ~~For UN1873, only glass inner packagings and glass inner receptacles are authorized respectively for combination packagings and composite packagings.~~

Proposed

PP28 For UN 1873, parts of packagings which are in direct contact with perchloric acid shall be constructed of glass or plastic.