

## Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

17 October 2023

### Sub-Committee of Experts on the Transport of Dangerous Goods

#### Sixty-third session

Geneva, 27 November – 6 December 2023

Item 3 of the provisional agenda

#### Listing, classification and packing

## Hermetically sealed packaging

### Submitted by the expert from the Netherlands

## I. Introduction

1. At the sixty-second session of the Sub-Committee, the expert from the Netherlands submitted informal document INF.6 on identified safety problems concerning hermetically sealed packagings where dangerous goods were found to have egressed from approved intact packagings. The expert from the Netherlands is grateful for all the valuable comments received.

2. As discussed at the sixty-second session, the *Model Regulations* do not provide a definition of the term “hermetically sealed”. Furthermore, the various packing instructions which require hermetically sealed packaging for certain dangerous goods do not include any specific requirements nor criteria to unambiguously determine whether a packaging is hermetically sealed or not.

3. From the report of the sixty-second session (document ST/SG/AC.10/C.3/124, paragraph 45), it was noted that:

“The Sub-Committee agreed on the need to clarify in the *Model Regulations* the term “hermetically sealed”. Most of the experts who spoke were of the opinion that it should be defined as “air or gas tight”, but in addition to such a definition, an appropriate test method could be considered including a proof that the dangerous goods packagings remain sealed during transport. The expert from the Netherlands invited all experts to send him further written comments and volunteered to work on a more detailed proposal for consideration at the next session.”

## II. Approach

4. The interpretation of “hermetically sealed packaging” includes on one hand side the unintended egress of dangerous goods from the packaging and on the other, the entry of water, moisture or air into the packaging that may react dangerously with its contents. To solve the current problems, it is proposed to follow a two-step approach. The first step is to come up with a (preliminary) definition of “hermetically sealed” for packaging. This definition will set the base for step 2: developing the necessary associated criteria and tests on how to achieve hermetically sealed packaging. To develop such criteria and tests it is essential to have a common view on what is meant by hermetically sealed packaging. If new insights gained in step 2 require the preliminary definition determined in step 1 to be altered, then this will be done accordingly.

5. The aim of this document is to initiate the discussion on the definition of hermetically sealed packaging. Based on the input received, the expert from the Netherlands will submit an official document for the next session of the Sub-Committee.

### III. Definition of hermetically sealed packaging

6. Besides the *Model Regulations*, other regulations such as RID, ADR, ADN and ICAO TI, do neither provide a definition for “hermetically sealed”. The IMDG Code however does provide a brief definition in paragraph 4.1.0 as follows:

“Hermetically sealed: vapour-tight closure.”

7. The wording “vapour tight” as used in the IMDG Code, is only used once in the *Model Regulations*, in packing instruction P301 which is assigned to UN No. 3165 AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK, and is therefore not a commonly used term in the Regulations.

8. In the report of the last session it was noted that hermetically sealed should be defined as “air or gas tight”. The term “gas-tight” is used at multiple locations in the *Model Regulations*, sometimes in the same packing instruction as “hermetically sealed”, such as in packing instructions P601 (4b) and P602 (4b). The term “air tight” is however not yet mentioned in the *Model Regulations*, although “air tightness” is used in paragraph 6.5.6.7.3 related to the leakproofness test.

9. In other parts of the *Model Regulations* (special provisions 342, packing instruction P200 and paragraph 5.2.1.7.2) “leak-tight” is used to ensure that there is no egress of dangerous goods from the packaging. Although in paragraph 5.2.1.7.2 both “leak-tight” and “hermetically sealed” are used in different indents which seems to indicate a different meaning. “Leaktight” is mentioned in paragraph 6.4.11.8, while “watertight” is used in paragraphs 4.3.2.6 and 6.4.11.8. Therefore, it seems that different terms are used throughout the *Model Regulations* to indicate that there shall be no leakage whatsoever from a packaging.

10. The difference between some of these terms seems to relate to the physical state of a substance (i.e. liquid, vapour or gas). The expert from the Netherlands is of the opinion that the definition should refer to an air-tight or leak-tight packaging, instead of gas-, water- or vapour-tight, in order to ensure that a hermetically sealed packaging encompasses all type of substances.

11. Furthermore, it needs to be considered whether air- or leak-tight means from the inside out (e.g. for substances with inhalation toxicity), from the outside in (e.g. no air or moisture should enter the packaging to prevent contamination of the contents), or both.

12. When it comes to the type of closures used, in P403 the requirement “hermetically sealed” is accompanied by an example of how to achieve that: “Inner packagings shall be hermetically sealed (e.g. by taping or by threaded closures).”. Additionally, the definition should also make clear that the packaging functions adequately during transport. Although the latter may depend on the duration of the transport and thus on the transport mode.

13. To summarize, a definition should refer to an air-tight or leak-tight closure that functions adequately under normal transport conditions.

### IV. Proposal

14. Two options are proposed to add a definition for “hermetically sealed” in section 1.2.1 of the *Model Regulations*, as follows:

#### 1. Option 1

15. *Hermetically sealed* means an air-tight closure for packaging that is designed and constructed in such a way that there is no egress from or ingress into the package under normal conditions of transport;

## 2. Option 2

16. *Hermetically sealed* means a leak-tight closure for packaging that is designed and constructed in such a way that there is no egress from or ingress into the package under normal conditions of transport;

17. The expert from the Netherlands is interested in hearing the views of the Sub-Committee on the proposed definition.

## V. Sustainable Development Goals

18. By formulating a definition for hermetically sealed, the Sub-Committee helps to implement the United Nations Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages and its target to substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination, and Sustainable Development Goal 12: Ensure sustainable consumption and production patterns and its target to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

---