



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

Sixty-third session

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Item 6 (d) of the provisional agenda

Miscellaneous proposals for amendments to the Model Regulations on the Transport of Dangerous Goods:

Other miscellaneous proposals

Stacking test

Transmitted by the expert from Spain*

I. Introduction

1. In document ST/SG/AC.10/C.3/2023/2 presented by Spain at the last session of the Sub-Committee, amendments to the note under 1.2.2.1 were proposed to eliminate the use of kg as a unit of force. Additionally, consequential amendments were analysed in proposals 4 and 5, and the stacking test was singled out as one occasion when kg was still used as a reference for forces.

2. The amendments to the note under 1.2.2.1 were adopted at the last session. The proposals related to the stacking test are further analysed in this document. The proposed amendments take into account the comments received during the discussions at the last meeting of the Sub-Committee and the comments received afterwards in written form.

II. Analysis

3. The stacking test is described in 6.1.5.6 as “the test sample shall be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport”. This gives a relationship between the force applied (measured in N) and the weight (measured in N); it does not establish a direct relationship to the mass (measured in kg) and, therefore, the wording is accurate and in accordance with the international system of units.

4. Also, the stacking test defined in 6.4.15.5 indicates an equivalency between the load and the weight.

5. In several other paragraphs, nevertheless, a comparison is made in between loads (measured in N) and mass (measured in kg); this should not be done, as it is only possible to compare values measured in the same units. Specifically, reference is made directly to the

* A/77/6 (Sect. 20), table 20.6



stacking test load and its value in kg, which is in principle incorrect, as the load should be measured in N. Therefore, the different paragraphs related to the stacking test have been analysed, and those which are not coherent in themselves, as they compare forces with mass, or apply an incorrect unit, have been singled out.

6. This happens in the following occasions:

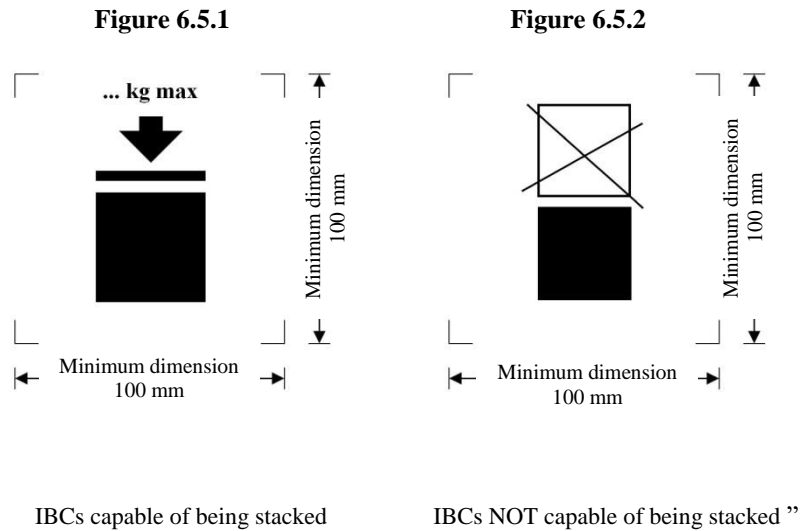
- Primary marking for intermediate bulk containers (IBCs) under 6.5.2.1.1:

(g) “The stacking test load in kg. For IBCs not designed for stacking, the figure “0” shall be shown;”

- 6.5.2.1.3 Examples of marking for various types of IBC in accordance with (a) to (h) above, first example:

... “/the stacking test load in kg/” ...

- 6.5.2.2.2 “The maximum permitted stacking load applicable shall be displayed on a symbol as shown in Figure 6.5.1 or Figure 6.5.2. The symbol shall be durable and clearly visible.



- 6.5.6.6.4

“Calculation of superimposed test load

The load to be placed on the IBC surface shall be 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top of the IBC during transport.”

- 6.6.3.1 Primary marking:

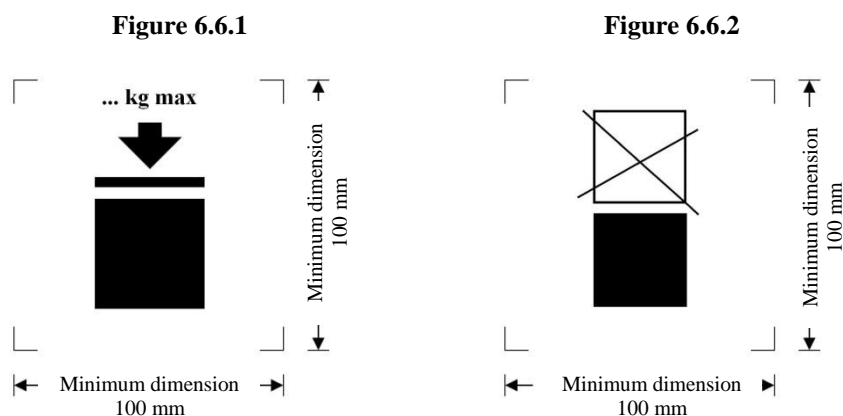
(g) “The stacking test load in kg. For large packagings not designed for stacking the figure “0” shall be shown;”

- 6.6.3.2 Examples of markings, first and second examples:

... “stacking load: 2 500 kg;” ... (twice)

- 6.6.3.3 “The maximum permitted stacking load applicable shall be displayed on a symbol as shown in Figure 6.6.1 or Figure 6.6.2.

The symbol shall be durable and clearly visible.



Large packagings capable of being stacked Large packagings NOT capable of being stacked ”

• 6.8.5.5 Marking

(g) “The stacking test load in kg;”

7. In all these cases, amendments to the texts have been proposed, with the objective of avoiding contradictions (comparing masses with forces, or using the wrong unit), but avoiding any further amendments.

8. The most fundamental change is referring to the superimposed stacking mass instead of referring to the test load. This is coherent as in the stacking mark reference is done to kg that are to be stacked on top. The mark shown in figure 6.5.1 and figure 6.6.1 is very intuitive; it shows the maximum mass that can be stacked on the IBC or large packaging during transport. This mark is not modified, only the language of the text referring to it.

III. Proposals

9. The following amendments are proposed (new text in **bold**, deleted text ~~stricken through~~)

(a) Primary marking of IBCs under 6.5.2.1.1 (g):

“The **superimposed stacking mass** ~~test load~~ in kg. For IBCs not designed for stacking, the figure “0” shall be shown;”

(b) Examples of marking in 6.5.2.1.3, first example:

“... /the **superimposed stacking mass** ~~test load~~ in kg/ ...”

(c) Text in 6.5.2.2.2:

“The maximum permitted **superimposed stacking mass** ~~load~~ applicable shall be displayed on a symbol as shown in figure 6.5.1 or figure 6.5.2. The symbol shall be durable and clearly visible.”

(d) 6.5.6.6.4 “Calculation of superimposed test load

The ~~mass load to be~~ placed on the IBC **surface to create the superimposed test load** shall be 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top of the IBC during transport.”

(e) Primary marking of large packagings under 6.6.3.1 (g):

“The **superimposed stacking mass** ~~test load~~ in kg. For IBCs not designed for stacking, the figure “0” shall be shown;”

(f) Examples of marking in 6.6.3.2, first and second examples:

“... **superimposed stacking mass** ~~load~~: 2 500 kg; ...” (twice)

(g) Text in 6.6.3.3:

“The maximum permitted **superimposed** stacking **mass load** applicable shall be displayed on a symbol as shown in figure 6.6.1 or figure 6.6.2. The symbol shall be durable and clearly visible.”

(h) Marking of bulk containers in 6.8.5.5.1 (g):

“The **superimposed** stacking **mass test-load** in kg;”

IV. Justification

10. Ensuring a more systematic approach and a better rationale in the *Model Regulations* helps to create clearer legal texts and to avoid different criteria among different countries and inspection services, and thus helps to implement target 16.6 of the 2030 Agenda for sustainable development (*Develop effective, accountable and transparent institutions at all levels*).
