

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

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

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Item 6 (b) of the provisional agenda

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

**Large packaging performance testing for articles with the
potential to produce excessive heat – Proposal for
Chapter 6.6**

Transmitted by the expert from the United Kingdom

Introduction

1. As indicated in document ST/SG/AC.10/C.3/2019/30 this paper offers detailed proposals to add a new design type test for large packagings intended to contain articles which have the capability of producing excessive heat into Chapter 6.6 with accompanying modifications to the UN packagings mark. It follows the same philosophy as the proposals for Chapter 6.1 in INF.8

Proposal 1 - testing

2. Proposal for a new design type test in chapter 6.6.

Add the following new test text as 6.6.5.3.5:

“6.6.5.3.5 Internal heat resistance test

6.6.5.3.5.1 Applicability

For all types of large packagings as a design type test, intended to contain articles which if accidentally initiated have the capability of producing excessive heat or could catch fire, other than articles of class 1.

6.6.5.3.5.2 Preparation of large packaging for test

The large packaging as prepared for transport shall be filled with an article or articles equal to the gross mass of articles tested in 6.6.5.3.4.

NOTE: For this test it is not necessary to use the same number and size of articles as used in the test samples for 6.6.5.3.4 provided the gross mass remains the same.

Initiation of the content shall be done in such a way so that subsequently it does not influence the results. e.g. if heaters are used they shall be switched off once initiation of an event occurs. Where test content is an electrical storage system (e.g. lithium ion battery) test content shall be fully charged and the total watt hour rating recorded. Where test content is a heat generating article, the maximum “burn” temperature of an unpackaged article should be recorded (e.g. for a chemical oxygen generator).

6.6.5.3.5.3 Method of testing and duration

The test articles shall be initiated in a suitable manner in the closed large packaging such that the whole content is initiated during the test.

The observation period shall be 6 hours from initiation or until the reaction is complete whichever is the shorter. Throughout the test the surface temperature of the large packaging shall be continuously recorded in at least 5 different places expected to be those most likely to display a temperature rise.

At least one temperature sensor shall be placed inside the large packaging, ideally in a void to record the internal temperature inside the large packaging.

The large packaging shall be observed throughout the reaction period and any flames seen on the outside of the large packaging shall be noted.

Once the content has ceased reacting and the large packaging cooled, the tested large packaging will be subjected to a repeat of the stacking test as performed in accordance with 6.6.5.3.3. Where the stack is shown as 0 and the large packaging has been required to undergo a top lift test, then this test shall be redone in accordance 6.6.5.3.2. For large packagings which have not been stacked or top lift tested then the bottom lift test shall be redone in accordance with 6.6.5.3.1.

6.6.5.3.5.4 Criteria for passing the test

- (a) The external surface temperature of the large packaging did not exceed 100°C;
- (b) No flames were seen outside the large packaging; and
- (c) The large packaging passes the repeat of the stack test or the top lift test or the bottom lift test, as appropriate.”

Proposal 2 – Marking

3. In order to verify that the large packaging has passed the additional internal heat resistance test, the expert from the United Kingdom offers two alternative solutions for consideration by the Sub-Committee.

Option 1

Making an amendment to the packaging code which introduces an additional letter to indicate that the large packaging has passed the internal heat resistance test.

Amend 6.6.2.2 as follows, (new text underlined)

“The letters “F” or “T” or “W” may follow the large packaging code. The letter “F” signifies an internally heat resistant large packaging conforming to the requirements of 6.6.5.3.5. The letter “T” signifies a large salvage packaging conforming to the requirements of 6.6.5.1.9. The letter “W” signifies that the large packaging, although of the same type indicated by the code, is manufactured to a specification different from those in 6.6.4 and is considered equivalent under the requirements of 6.6.1.3.”

Add a new example to 6.6.3.2 as follows:

6.6.3.2

“50AF/Y/04 19/GB/9516 GHIJ/1080/600	For a large metal packaging suitable for
	<u>stacking and additionally tested for</u>
	<u>internal heat resistance”</u>

Option 2

Add a new element to the primary mark in 6.6.3.1.

Insert a new sub-paragraph (i) to 6.6.3.1 as follows, (new text underlined):

“(i) The letter “F” where the large packaging has passed the tests in 6.6.5.3.5”;

Add a new example to 6.6.3.2 as follows:

6.6.3.2

“50A/Y/04 19/GB/9516 GHIJ/1080/600/F	For a large metal packaging suitable for
	<u>stacking and additionally tested for</u>
	<u>internal heat resistance”</u>

Proposal 3 – Performance rating

4. To indicate the performance rating of the packaging so tested, the following new text is proposed:

Create a new heading:

“6.6.3.3 Secondary marking”

Renumber the existing paragraph 6.6.3.3 as 6.6.3.3.1.

Insert a new paragraph:

“6.6.3.3.2 Large packagings tested for internal heat resistance in accordance with 6.6.5.3.5 shall bear the following additional mark or marks near the marks prescribed in 6.6.3.1:

- Where the test content was electrical storage systems the total kilowatt hour rating tested in the large packaging; or
- For all other heat generating articles, the maximum internal temperature in °C recorded during the large packaging test, achieved for at least 10 consecutive seconds.”