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## Economic Commission for Europe

### Inland Transport Committee

### Working Party on the Transport of Dangerous Goods

#### Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods

Geneva, 17-27 September 2013

Item 7 of the provisional agenda

#### Reports of informal working groups

### Flexible bulk containers

#### Submitted by the Government of the United Kingdom<sup>1, 2</sup>

### Introduction

1. The informal working group on flexible bulk containers (FBCs) was held in St. Petersburg, Russian Federation, on 28 May 2013 at the invitation of the International Dangerous Goods and Containers Association (IDGCA). The report of the Working Group has been submitted as document ECE/TRANS/WP.15/AC.1/2013/59.

2. Depending on the decisions taken by the Joint Meeting in respect of the outcome of the Working Group, the United Kingdom now proposes on behalf of the Working Group to adopt provisions for the design, testing and operation of flexible bulk containers.

### Proposal

3. Amend RID/ADR/ADN as proposed in ECE/TRANS/WP.15/AC.1/2012/29 with changes indicated by underlined text for additions or strike-out text for deletions.

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<sup>1</sup> In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106, ECE/TRANS/2010/8, programme activity 02.7 (c)).

<sup>2</sup> Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2013/37.

## Chapter 6.11

6.11.1 Add the following new definition:

"*Flexible bulk container* means a flexible container with a capacity not exceeding 15 m<sup>3</sup> and a permissible gross mass of not more than 14 tonnes and includes liners and attached handling devices and service equipment".

6.11.2.3 In the table add the following new row:

Flexible bulk container	BK3
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6.11.3 In the heading, insert "BK1 or BK2" after "bulk containers".

6.11.4 In the heading, insert "BK1 and BK2" after "bulk containers".

Add a new section 6.11.5 to read as follows:

### **"6.11.5 Requirements for the design, manufacture, inspection and testing of BK3 flexible bulk containers ~~BK3~~**

#### **6.11.5.1 *Design and manufacture requirements***

6.11.5.1.1 Flexible bulk containers shall be sift-proof.

6.11.5.1.2 Flexible bulk containers shall be completely closed to prevent the release of contents.

6.11.5.1.3 Flexible bulk containers shall be waterproof.

6.11.5.1.4 Parts of the flexible bulk container which are in direct contact with dangerous goods:

(a) shall not be affected or significantly weakened by those dangerous goods;

(b) shall not cause a dangerous effects, e.g. catalysing a reaction or reacting with the dangerous goods; and-

(c) shall not allow permeation of the dangerous goods that could constitute a danger under normal conditions of carriage.

#### **6.11.5.2 *Service equipment and handling devices***

6.11.5.2.1 Filling and discharge devices shall be so constructed as to be protected against damage during carriage and handling. The filling and discharge devices shall be secured against unintended opening.

6.11.5.2.2 Slings of the flexible bulk container, if fitted, shall withstand pressure and dynamic forces, which can appear in normal conditions of handling and carriage.

6.11.5.2.3 The handling devices shall be strong enough to withstand repeated use.

#### **6.11.5.3 *Inspection and testing***

6.11.5.3.1 Each flexible bulk container design type shall successfully pass the tests prescribed in this Chapter before being used.

6.11.5.3.2 Tests shall ~~be carried out also be repeated~~ after each modification of the design type, which alters the design, material or ~~technology of manufacture~~ manner of construction of a flexible bulk container.

6.11.5.3.3 Tests shall be carried out on flexible bulk containers prepared as for carriage ~~in real conditions. During the testing period~~ flexible bulk containers shall be filled to the maximum mass; at which they ~~can~~ may be used and the contents shall be evenly distributed.

~~inside the container. The substances, which may fill the flexible bulk containers during the testing period, to be carried in the flexible bulk container shall have the same properties as the carried cargoes for the test results to be correct, except where this would invalidate the test results. May be replaced by other substances except where this would invalidate the results of the test.~~ When another substance is used it shall have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags with the of lead shot, to achieve the requisite total mass of the ~~packaging, flexible bulk container under condition that~~ so long as they are placed so that the test results are not affected.

6.11.5.3.4 Flexible bulk containers shall be manufactured and tested under ~~the a~~ quality assurance programme, which satisfies the competent authority, in order to ensure that each manufactured flexible bulk container meets the requirements of this Chapter.

6.11.5.3.5 *Drop test*

6.11.5.3.5.1 Applicability

For all types of flexible bulk containers, as a design type test.

6.11.5.3.5.2 Preparation for testing

The flexible bulk container shall be filled to its maximum permissible gross mass.

6.11.5.3.5.3 Method of testing

~~A~~The flexible bulk container shall be dropped onto a target surface that is non-resilient and horizontal. The target surface shall be:

- (a) Integral and massive enough to be immovable;
- (b) Flat with a surface kept free from local defects capable of influencing the test results;
- (c) Rigid enough to be non-deformable under test conditions and not liable to become damaged by the tests; and
- (d) Sufficiently large to ensure that the test flexible bulk container falls entirely upon the surface.

Following the drop, the flexible bulk container shall be restored to the upright position for observation.

6.11.5.3.5.4 Drop height shall be:

Packing group III: 0.8 m

6.11.5.3.5.5 Criteria for passing the test

- (a) There shall be no loss of contents. A slight discharge, e.g. from closures or stitch holes, upon impact shall not be considered to be a failure of the flexible bulk container provided that no further leakage occurs after the container has been restored to the upright position;
- (b) There shall be no damage, which renders the flexible bulk container unsafe to be carried for salvage or for disposal.

6.11.5.3.6 *Top lift test*

6.11.5.3.6.1 Applicability

For all types of flexible bulk containers as a design type test.

6.11.5.3.6.2 Preparation for testing

Flexible bulk containers shall be filled to six times the maximum net mass, the load being evenly distributed.

6.11.5.3.6.3 Method of testing

A flexible bulk container shall be lifted in ~~accordance with the method, stipulated by its construction until detachment~~ the manner for which it is designed until clear of t from the floor and maintained in that position for a period of five minutes.

6.11.5.3.6.4 Criteria for passing the test

There shall be no damage to the flexible bulk container or its lifting devices, which renders the flexible bulk container unsafe for carriage or handling, and no loss of contents.

6.11.5.3.7 *Topple test*

6.11.5.3.7.1 Applicability

For all types of flexible bulk containers as a design type test.

6.11.5.3.7.2 Preparation for testing

The flexible bulk container shall be filled to its maximum permissible gross mass.

~~Method of testing~~ Flexible bulk container shall be toppled onto any part of its top by lifting the side furthest from the drop edge upon a target surface that is non-resilient and horizontal. The target surface shall be:

~~Flexible bulk container shall be toppled onto any part of its top by lifting the side furthest from the drop edge upon a target surface that is non resilient and horizontal. The target surface shall be:~~

- (a) Integral and massive enough to be immovable;
- (b) Flat with a surface kept free from local defects capable of influencing the test results;
- (c) Rigid enough to be non-deformable under test conditions and not liable to become damaged by the tests; and
- (d) Sufficiently large to ensure that the tested flexible bulk container falls entirely upon the surface.

6.11.5.3.7.4 For all flexible bulk containers, the topple height is specified as follows:

Packing group III: 0.8 m

6.11.5.3.7.5 Criterion for passing the test

There shall be no loss of contents. A slight discharge, e.g. from closures or stitch holes, upon impact shall not be considered to be a failure of the flexible bulk container provided that no further leakage occurs.

6.11.5.3.8 ~~*Tilting-Righting test*~~

6.11.5.3.8.1 Applicability

For all types of flexible bulk containers designed to be lifted by the top or side part, as a design type test.

6.11.5.3.8.2 Preparation for testing

The flexible bulk container shall be filled to not less than 95% of its capacity and to its maximum permissible gross mass.

#### 6.11.5.3.8.3 Method of testing

The flexible bulk container, lying on its side, shall be lifted at a speed of at least 0.1 m/s to an upright position, clear of the floor, ~~with the help of~~ no more than half of the lifting devices.

#### 6.11.5.3.8.4 Criterion for passing the test

There shall be no damage to the flexible bulk container or its lifting devices, which renders the flexible bulk container unsafe for carriage or handling.

#### 6.11.5.3.9 *Tear test*

##### 6.11.5.3.9.1 Applicability

For all types of flexible bulk containers as a design type test.

##### 6.11.5.3.9.2 Preparation for testing

The flexible bulk container shall be filled to its maximum permissible gross mass.

##### 6.11.5.3.9.3 Method of testing

With the flexible bulk container placed on the ground, a 300 mm cut ~~on the widest side wall~~ shall be made, completely penetrating all layers of the flexible bulk container on a wall of a wide face. The cut shall be made at a 45° angle to the principal axis of the flexible bulk container, halfway between the bottom surface and the top level of the contents. The flexible bulk container shall then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum gross mass. The load must be applied for at least fifteen minutes. A flexible bulk container which is designed to be lifted from the top or the side shall, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of fifteen minutes.

##### 6.11.5.3.9.4 Criterion for passing the test

The cut shall not propagate more than 25% of its original length.

#### 6.11.5.3.10 *Stacking test*

##### 6.11.5.3.10.1 Applicability

For all types of flexible bulk containers as a design type test.

##### 6.11.5.3.10.2 Preparation for testing

The flexible bulk container shall be filled to its maximum permissible gross mass.

##### 6.11.5.3.10.3 Method of testing

The flexible bulk container shall be subjected to a force applied to its top surface that is four times the design load-carrying capacity ~~during for~~ 24 hours.

##### 6.11.5.3.10.4 Criterion for passing the test

There shall be no loss of contents during the test or after removal of the load.

#### **6.11.5.4 *Test report***

6.11.5.4.1 A test report containing at least the following particulars shall be drawn up and shall be available to the users of the flexible bulk container:

1. Name and address of the test facility;
2. Name and address of applicant (where appropriate);
3. Unique test report identification;

4. Date of the test report;
5. Manufacturer of the flexible bulk container;
6. Description of the flexible bulk container design type (e.g. dimensions, materials, closures, thickness, etc) and/or photograph(s);
7. Maximum capacity/maximum permissible gross mass;
8. Characteristics of test contents, e.g. particle size for solids;
9. Test descriptions and results;
10. The test report shall be signed with the name and status of the signatory.

6.11.5.4.2 The test report shall contain statements that the flexible bulk container prepared as for carriage was tested in accordance with the appropriate provisions of this Chapter and that the use of other containment methods or components may render it invalid. A copy of the test report shall be available to the competent authority.

**6.11.5.5 Marking**

6.11.5.5.1 Each flexible bulk container manufactured and intended for use according to ~~RID/ADR~~these regulations shall bear markings that are durable, legible and placed in a location so as to be readily visible. Letters, numerals and symbols shall be at least 24 mm high and shall show:

- (a) The United Nations packaging symbol



This symbol shall not be used for any purpose other than certifying that a packaging, a flexible bulk container, a portable tank or a MEGC complies with the relevant requirements in Chapters 6.1, 6.2, 6.3, 6.5, 6.6, 6.7 or 6.11 ;

- (b) The code BK3;
- (c) A capital letter designating the packing group(s) for which the design type has been approved:  
 Z for packing group III only;
- (d) The month and year (last two digits) of manufacture;
- (e) The character(s) identifying the country authorizing the allocation of the mark; as indicated by the distinguishing sign for motor vehicles in international traffic;
- (f) The name or symbol of the manufacturer and other identification of the flexible bulk container as specified by the competent authority;
- (g) The stacking test load in kg;
- (h) The maximum permissible gross mass in kg.

Marking shall be applied in the sequence shown in (a) to (h); each element of the marking, required in these subparagraphs, shall be clearly separated, e.g. by a slash or space and presented in a way that ensures that all of the parts of the mark are easily identified.

6.11.5.5.2 *Example of marking*



BK3/Z/11 09  
 RUS/NTT/MK-14-10  
 56000/14000".

*Consequential amendment:*

6.1.3.1 (a) (i), 6.2.2.7.2 (a), 6.2.2.9.2 (a), 6.3.4.2 (a), 6.5.2.1.1 (a), 6.6.3.1 (a), 6.7.2.20.1 (c) (i), 6.7.3.16.1 (c) (i), 6.7.4.15.1 (c) (i), 6.7.5.13.1 (c) (i) Amend the second sentence to read as follows: "This symbol shall not be used for any purpose other than certifying that a packaging, a flexible bulk container, a portable tank or a MEGC complies with the relevant requirements in Chapter 6.1, 6.2, 6.3, 6.5, 6.6, 6.7 or 6.11."

**Chapter 7.1**~~ADN~~ADN only:

7.1.1.18 In the heading and in the text, insert ", in bulk containers" after "~~large sized packagings~~containers".

**Chapter 7.3**

7.3.2.1 In the first sentence, replace "codes BK1 and BK2" with "codes BK1, BK2 and BK3". After the description of the meaning of BK1 and BK2, insert:

"BK3: Carriage in flexible bulk containers is permitted".

7.3.2.4 After "bulk containers", insert "(code BK2) and flexible bulk containers (code BK3)". The following adjustment in this subsection does not relate to the Russian text (ADN):

Add a new sub-section 7.3.2.9 to read as follows:

"7.3.2.9 *Use of flexible bulk containers*

7.3.2.9.1 Before a flexible bulk container is filled it shall be visually examined to ensure it is structurally serviceable, its textile slings, load-bearing structure straps, body fabric, lock device parts including metal and textile parts are free from protrusions or damage and that inner liners are free from rips, tears or any damage.

7.3.2.9.2 For flexible bulk containers, the period of use permitted for the carriage of dangerous goods shall be two years from the date of manufacture of the flexible bulk container.

7.3.2.9.3 A venting device shall be fitted if a dangerous accumulation of gases may develop within the flexible bulk container. The vent shall be so designed that the penetration of foreign substances or ingress of water is prevented under normal conditions of carriage."

(RID/ADR only:)

**Chapter 7.5**

~~7.5.1.2, 7.5.1.3~~ At the beginning, insert "Unless otherwise specified in RID/ADR,".

~~7.5.2 Add a new sub-section 7.5.2.4 to read as follows:~~

~~"7.5.2.4 Mixed loading of dangerous goods packed in limited quantities with any type of explosive substances and articles, except those of Division 1.4, Compatibility Group S, is prohibited."~~

Add a new sub-section 7.5.7.6 to read as follows:

7.5.7.6 *Loading of flexible bulk containers*

7.5.7.6.1 Flexible bulk containers shall be carried within a (ADR:) vehicle or container/(RID:) wagon or container with rigid sides and ends that extend at least two-thirds of the height of the flexible bulk container.

*NOTE: When loading flexible bulk containers in a (ADR:) vehicle or container/(RID:) wagon or container particular attention shall be paid to the guidance on the handling and stowage of dangerous goods referred to in 7.5.7.1 and to the IMO/ILO/UNECE Guidelines for Packing Cargo Transport Units (CTUs).*

7.5.7.6.2 Flexible bulk containers shall be secured by suitable means capable of restraining them in the (ADR:) vehicle or container/(RID:) wagon or container in a manner that will prevent any movement during carriage which would change the position of the flexible bulk container or cause it to be damaged. Movement of the flexible bulk containers may also be prevented by filling any voids by the use of dunnage or by blocking and bracing. Where restraints such as banding or straps are used, these shall not be over-tightened to cause damage or deformation to the flexible bulk containers.

7.5.7.6.3 Flexible bulk containers shall not be stacked."

ADN only:

4.1.3 In the first sentence, insert “, bulk containers” after “wagons”

In the first indent, delete “with the exception of BK3 containers”.

7.1.4.14.1.1 Add the following sentence at the end:

“Flexible bulk containers shall be stowed in such way that there are no void spaces between flexible bulk containers in the hold. If the flexible bulk containers do not completely fill the hold, adequate measures shall be taken to avoid shifting of cargo.”.

(Source: IMDG Code, para. 7.6.2.12.2)

7.1.4.14.1.2 Add the following sentence at the end:

“Flexible bulk containers may be stacked on each other in holds provided that the stacking height does not exceed 3 high. When flexible bulk containers are fitted with venting devices, the stowage of the flexible bulk containers shall not impede their function.”.

(Source: IMDG Code, para 7.6.2.12.3 and 7.6.2.12.4)