



**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****Fifty-fifth session**

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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****Packing group I for liquids packed in metal IBCs****Transmitted by the Stainless Steel Container Association (SSCA)*****Introduction**

1. Chapter 4.1 of the “Model Regulations” describes the use of packagings, including Intermediate Bulk Containers (IBC) and Large packagings.
2. According to 4.1.1.10 the transport in metal IBC of products of packing group II and III with a maximum vapour pressure of 110 kPa (1.1 bar) at 50°C respectively 130 kPa (1.3 bar) at 55°C and a maximum volume of 3000 l is possible.
3. We propose, that in the future:
 - (a) substances of packing group I with a maximum vapour pressure of 150 kPa (1.5 bar) at 50 °C respectively 195 kPa (1.95 bar) at 55 °C with a volume of up to 1.500 l can be transported in metal IBCM;
 - (b) For these metal IBC stricter rules for design type testing shall apply:
 - (i) Hydraulic pressure testing:
The test pressure shall be set to 250 kPa (2.5 bar).
 - (ii) Drop test:
 - The drop height shall be set at 1.8 m for a relative density of up to 1.2 kg/dm³.
 - Example: A relative density of 1.8 kg/dm³ accounts for a drop height of 2.7 m (1.8 x 1.5 = 2.7).

* In accordance with the programme of work of the Sub-Committee for 2019–2020 approved by the Committee at its ninth session (see ST/SG/AC.10/C.3/108, paragraph 141 and ST/SG/AC.10/46, paragraph 14).

- (iii) Leak test:

The test pressure shall be set at 30 kPa (0.3 bar).

Justification

4. Quality assurance programs, the application of finite element method stress calculations, more stability in the manufacturing process with less tolerances as well as improvement in materials and welding technology, nowadays facilitate the production of metal IBC with vastly improved performance levels. Also test procedures and non-destructive test (NDT) methods have improved in the last decades and validate the specification.

5. Fillers are searching for alternatives in packaging, which are compatible to existing filling installations and equivalent regarding their safety.

6. With the higher testing requirements, that we propose, the necessary safety level for the transport of substances in packing group I is, in our view, ensured.

7. Regarding our specific proposals for testing we would like to note the following:

- (a) Hydraulic Pressure Testing:

The new test pressure (250 kPa (2.5 bar)) is already applied for the approval of metal IBC of the 21A type for substances of packing group I.

- (b) Drop Test:

The proposed drop height be set at 1.8 m is already established for solids of packing group I for a relative density of up to 1.2 kg/dm³. For substances with a higher relative density (D) the drop height shall be determined from the relative density and a factor of 1.5 (along the lines of the calculation for packing groups II and III).

- (c) Leak test:

The proposal to increase the leak pressure from 20 kPa (0.2 bar) to 30 kPa (0.3 bar) is justified to ensure the risk at conditions encountered during the transport of dangerous goods.

8. SSCA like to invite the Sub-Committee to consider the following proposal.

Proposal

9. Amend the definition of *Intermediate Bulk Container (IBC)* in 1.2.1 as follows (New text is underlined)

“Intermediate Bulk Container (IBC)

IBC means any rigid or flexible portable packaging, other than those specified in Chapter 6.1, that:

- (a) has a capacity of:

- (i) not more than 3.0 m³ (3.000 litres) for solids and liquids of packing groups II and III;
- (ii) not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard and wooden IBCs;

- (iii) not more than 3.0 m³ for solids of packing group I when packed in metal IBCs;
- (iv) not more than 3.0 m³ for radioactive material of Class 7;
- (v) not more than 1.5 m³ for liquids of packaging group I when filled in metal IBCs;
- (b) is designed for mechanical handling;
- (c) is resistant to the stresses produced in handling and transport, as determined by tests;”
10. Amend the last paragraph under 4.1.1.10 to read as follows:
 “IBCs intended for the transport of liquids shall not be used to carry liquids having a vapour pressure of more than ~~110 kPa (1.1 bar)~~ 150 kPa (1.5 bar) at 50 °C or ~~130 kPa (1.3 bar)~~ 195 kPa (1.95 bar) at 55 °C.”.
11. In 4.1.4.2 Amend special packing provision B8 in IBC02 and IBC03 as follows:
 “4.1.4.2 *Packing instructions concerning the use of IBCs*
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| <p>“B8 The pure form of this substance shall not be transported in IBCs since it is known to have a vapour pressure of more than 110 kPa <u>150 kPa</u> at 50 °C or 130 kPa <u>195 kPa</u> at 55 °C.”.</p> |
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12. Amend 6.5.2.1.1(c)(i) to read as follows:
 “(c) A capital letter designating the packing group(s) for which the design type has been approved:
 (i) X for packing groups I, II and III (~~IBCs for solids only~~);
 (ii) Y for packing groups II and III;
 (iii) Z for packing group III only;”.
13. Insert a new (d) in 6.5.6.8.4.1 as follows:
 “6.5.6.8.4.1 Metal IBCs:
 (a) For IBCs of types 21A, 21B and 21N, for packing group I solids, a 250 kPa (2.5 bar) gauge pressure;
 (b) For IBCs of types 21A, 21B, 21N, 31A, 31B and 31N, for packing groups II or III substances, a 200 kPa (2 bar) gauge pressure;
 (c) In addition, for IBCs of types 31A, 31B and 31N, for packing group II and III, a 65 kPa (0.65 bar) gauge pressure. This test shall be performed before the 200 kPa test.
(d) In addition, for IBCs of types 31A for packing group I, II and III, a 150 kPa (1.5 bar) gauge pressure. This test shall be performed before the 250 kPa test.”
14. Amend 6.5.6.9.4 (a) and (b) as follows:
 “6.5.6.9.4 *Drop height*
 For solids and liquids, if the test is performed with the solid or liquid to be transported or with another substance having essentially the same physical characteristics:

Packing group I	Packing group II	Packing group III
1.8 m	1.2 m	0.8 m

For liquids if the test is performed with water:

- (a) Where the substances to be transported have a relative density not exceeding 1.2:

<u>Packing group I</u>	Packing group II	Packing group III
<u>1.8 m</u>	1.2 m	0.8 m

- (b) Where the substances to be transported have a relative density exceeding 1.2, the drop heights shall be calculated on the basis of the relative density (d) of the substance to be transported rounded up to the first decimal as follows:

<u>Packing group I</u>	Packing group II	Packing group III
<u>$d \times 1.5$ m</u>	$d \times 1.0$ m	$d \times 0.67$ m”

15. Insert a new paragraph at the end of current 6.5.6.7.3 as follows:

“6.5.6.7.3 Method of testing and pressure to be applied

The test shall be carried out for a period of at least 10 minutes using air at a gauge pressure of not less than 20 kPa (0.2 bar). The air tightness of the IBC shall be determined by a suitable method such as by air-pressure differential test or by immersing the IBC in water or, for metal IBCs, by coating the seams and joints with a soap solution. In the latter case a correction factor shall be applied for the hydrostatic pressure.

For packing group I, the test shall be carried out for a period of at least 10 minutes using air at a gauge pressure of not less than 30 kPa (0.3 bar). The air tightness of the IBC shall be determined by a suitable method such as by air-pressure differential test or by immersing the IBC in water or, for metal IBCs, by coating the seams and joints with a soap solution. In the latter case a correction factor shall be applied for the hydrostatic pressure.”