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 **28 November 2018**

Fifty-fourth session
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Item 2 (f) of the provisional agenda
Recommendations made by the Sub-Committee on its fifty-first, fifty-second and fifty-third sessions and pending issues: miscellaneous pending issues

Comments on ST/SG/AC.10/C.3/2018/96

Transmitted by the Stainless Steel Container Association (SSCA)

Introduction

1. SSCA was asked to bring forward the proposal with slight editorial changes and with some additional explanations to account for the concerns mentioned in discussion of working document 2018/96. This brings us to the main arguments for deletion of the minimum wall thickness for Metal-IBCs.

2. The minimum wall thickness requirements originated from tank containers and pressure vessel requirements for IMO tanks. Consequentially, it was accepted as a compromise for the Model Regulations to allow the introduction of IBCs for multimodal transport. The rationale for a minimum wall thickness requirement is appropriate for pressure vessels and tanks, but not technically justified for unpressurized IBCs.

3. Since their introduction into the Model Regulations a lot of technical progress came about:

- **In the past** it was not possible to weld container shells with a material thickness of less than 2.0 mm reproducible in high quality as the tolerances of welded parts did not allow a stable manufacturing process.
- **Modern welding methods** procedures allow the use of thinner material.
- Deep drawing tools have improved in the last decades and allow for a much higher welding position accuracy. This is a precondition for precision welding and reproducible quality in the IBC manufacturing process.
- Finite Element Method stress calculations enable manufacturers to identify points of maximum load during the design process to ensure a minimum safety level.
- Test procedures and non destructive test (NDT) methods have improved in the last decades and validate the specification of the IBCs (e.g. the type approval specification) brought into the market.

4. Corrosion resistance is not accomplished by wall thickness but by material selection and design and it is covered by other parts of the regulation.

Proposal

5. In the table in 6.5.2.2.1, delete "minimum" in the fourth row under "Additional marks" as follows:

[“

Additional marks	Category of IBC				
	Metal	Rigid Plastics	Composite	Fibreboard	Wooden
Capacity in litres[a] at 20 °C	X	X	X		
Tare mass in kg[a]	X	X	X	X	X
Test (gauge) pressure, in kPa or bar[a], if applicable		X	X		
Maximum filling/discharge pressure in kPa or bar[a], if applicable	X	X	X		
Body material and its ~~minimum~~ thickness in mm	X				
Date of last leakproofness test, if applicable (month and year)	X	X	X		
Date of last inspection (month and year)	X	X	X		
Serial number of the manufacturer	X				
Maximum permitted stacking load [b]	X	X	X	X	X

a *The unit used shall be indicated.*

b *See 6.5.2.2.2. This additional mark shall apply to all IBCs manufactured, repaired or remanufactured as from 1 January 2011. ”]*

6. Amend 6.5.5.1.6., as follows:

[“6.5.5.1.6 *Minimum wall thickness*

Metal IBCs with a capacity more than 1500 litres shall comply with the following minimum wall thickness requirement:

(a) For a reference steel having a product of Rm x A_0 = 10 000, the wall thickness shall not be less than:

~~Capacity (C) in litres~~	Wall thickness (T) in mm			
	Types 11A, 11B, 11N		Types 21A, 21B, 21N, 31A, 31B, 31N	
	Unprotected	Protected	Unprotected	Protected
~~C ≤ 1000~~ ~~1000 < C ≤ 2000~~ ~~2000 < C ≤ 3000~~	~~2.0~~ ~~T = C/2000 + 1.5~~ ~~T = C/2000 + 1.5~~ T = C/2000 + 1.5	~~1.5~~ ~~T = C/2000 + 1.0~~ ~~T = C/2000 + 1.0~~ T = C/2000 + 1.0	~~2.5~~ ~~T = C/2000 + 2.0~~ ~~T = C/1000 + 1.0~~ T = C/1000 + 1.0	~~2.0~~ ~~T = C/2000 + 1.5~~ ~~T = C/2000 + 1.5~~ T = C/2000 + 1.5

where: A_0 = minimum elongation (as a percentage) of the reference steel to be used on fracture under tensile stress (see 6.5.5.1.5);

(b) For metals other than the reference steel described in (a), the minimum wall thickness is given by the following equivalence formula:

$$e_1 = \frac{21.4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}}$$

where: e_1 = required equivalent wall thickness of the metal to be used (in mm);

e_0 = required minimum wall thickness for the reference steel (in mm);

Rm_1 = guaranteed minimum tensile strength of the metal to be used (in N/mm) (see (c));

A_1 = minimum elongation (as a percentage) of the metal to be used on fracture under tensile stress (see 6.5.5.1.5).

However, in no case shall the wall thickness be less than 1.5 mm.

(c) For purposes of the calculation described in (b), the guaranteed minimum tensile strength of the metal to be used (Rm_1) shall be the minimum value according to national or international material standards. However, for austenitic steels, the specified minimum value for Rm according to the material standards may be increased by up to 15% when a greater value is attested in the material inspection certificate. When no material standard exists for the material in question, the value of Rm shall be the minimum value attested in the material inspection certificate."].