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**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****Forty-ninth session**

Geneva, 27 June – 6 July 2016

Item 5 (b) of the provisional agenda

**Transport of gases: miscellaneous****Further comments on the adoption of  
ST/SG/AC.10/C.3/2015/39 and unanticipated impacts – New  
and revised ISO standards adopted in 6.2.2****Transmitted by the experts from Canada, Australia, and the United  
States of America<sup>1,2</sup>****Purpose**

1. To raise additional issues with the full adoption of ISO 21172-1:2015 into the Model Regulations, and to propose a modification to the reference made to ISO 21172-1:2015 that would address these issues.
2. Reference is made to the following documents:
  - (a) ST/SG/AC.10/C.3/2015/39;
  - (b) Informal document INF.49 (48<sup>th</sup> session).

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<sup>1</sup> In accordance with the programme of work of the Sub-Committee for 2015–2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.3/92, paragraph 95 and ST/SG/AC.10/42, para. 15).

<sup>2</sup> The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

## Introduction

3. In ST/SG/AC.10/C.3/2015/39, the International Organisation for Standardisation (ISO) proposed the introduction of two revised ISO standards and one new ISO standard into 6.2.2 of the Model Regulations. ST/SG/AC.10/C.3/2015/39 was adopted by the Sub-Committee as proposed by ISO (see ST/SG/AC.10/C.3/96, paras 65-68 and addendum 1) by the Sub-Committee.

4. In paragraph 6 of ST/SG/AC.10/C.3/2015/39, a new reference to ISO 21172-1:2015 was added with a new paragraph 6.2.2.1.8 and new table:

6.2.2.1.8 The following standard applies for the design, construction and initial inspection and test of UN pressure drums, except that inspection requirements related to the conformity assessment system and approval shall be in accordance with 6.2.2.5:

Reference	Title	Applicable for Manufacture
ISO 21172-1: 2015	Gas cylinders – Welded steel pressure drums up to 3 000 litres capacity for the transport of gases – Design and construction – Part 1: Capacities up to 1 000 litres	Until further notice

5. As was discussed in informal document INF.49 (48<sup>th</sup> session), the adoption of ISO 21172-1:2015 in the Model Regulations addresses the long-standing need for pressure drum requirements.

6. The draft ISO standard (ISO/DIS 21172-1) contained the following statement in section 7.3.3.4:

“WARNING NOTE Care should be taken when dished ends convex to pressure are used in potentially corrosive service.”

7. The warning note was amended to an actual restriction in section 6.3.3.4 of ISO/FDIS 21172-1 based on a proposed change submitted by an ISO member body during the ISO/DIS 21172-1 ballot.

8. One of the key principles of the ISO policy on global governance is to not give preference to the requirements of specific countries or regions when different needs or interests exist in other countries or regions. This principle is also germane to the work of the Sub-Committee in ensuring that the Model Regulations maintain a global perspective. The long history of use in multiple regions with no safety problems, and the absence of any data demonstrating there exists a safety problem, warrant recognition of this commonly employed design feature within the Model Regulations.

## Considerations

9. Pressure drums, commonly referred to as ton tanks, ton containers, or multi-unit tank car tanks, with dished ends convex to pressure, have been used in corrosive gas service in North America since 1936. These means of containment have an exemplary safety record when inspected and tested at the prescribed frequency, as made evident by the fact that containers manufactured in 1936 are still in service. Information on the inspection, testing, cleaning, and re-conditioning of these containers can be found in industry recommendations. One such example is the Chlorine Institute’s *Pamphlet 17 – Packaging Plant Safety and Operational Guidelines*. This document can be accessed at <http://bit.ly/1MxMWYG>.

10. Based on information collected from the chlorine industry, there are no known incidents such as corrosion damage at the head seams recorded in the available history that are due to the construction / design of these containers.

11. Furthermore, Australian industry data has identified no incidents since 1997 with 178 598 documented 106-style containers fills. There are two (2) known incidents in Australia involving the failure of this drum type, but in both cases the drums were involved in major vehicle or building fires. There are no known Australian incidents since the introduction of these 106-style containers in the 1950s due to internal or external corrosion of the drums.

12. Such containers are used typically in chlorine and sulphur dioxide gas service. A picture of a chlorine ton container (TC Specification 106A500X) is shown below for illustration purposes:



13. The design of the 106-style container makes it unnecessary to weld the rolling bands, the valve protection skirt, or both on the container's barrel. The generally accepted principle is that welded elements weaken the whole container, and this has been the suspected source of a few chlorine-related accidents with 110-style containers that contain such welds. As well, ends convex to pressure offer strong protection for the drum valves; experience in some regions has found that this valve configuration offers superior valve protection to mechanisms used on pressure vessels that do not have ends that are convex to pressure (e.g., metal covers).

14. The 106-style container allows the use of a simple and reliable tool in temporarily sealing leaks due to rust holes in the shell ring and leaking valves (commonly referred to as a chlorine B-kit). The design of the 106-style allows this tool to be used safely and efficiently. While the B-kit can also be used on the 110-style container, the widespread training and resources provided by industry experts is focused around use of the B-kit on the 106-style container due to the prevalent use of that container. More information on the Chlorine B-kit can be found at <http://bit.ly/1LuIUpb>.

15. With respect to public health, the 106-style specification container is the most commonly used container to transport chlorine throughout the world for the purpose of supplying chlorine for water treatment. The restriction adopted in 6.2.2.1.8 imposes a burden on obtaining chlorine for water treatment and may create hardships for countries that depend on these safe containers for water treatment needs.

16. In the Russian Federation, drums having heads concave to pressure (e.g., 110-style) for chlorine and other corrosive products have traditionally been used. About ten (10) years ago, there was a shortage of chlorine for water treatment plants in the North-Western Region (Leningrad Region). Regulatory authorities appointed the Russian Chlorine Safety Centre to perform a comprehensive safety assessment and comparative analysis of the 106-style and 110-style containers to determine if it was safe and feasible to receive chlorine from countries closest to the region that used 106-style containers. This analysis

demonstrated that both containers fully complied with relevant Russian technical regulations and led to official permission by the State Regulator to use the 106-style containers in the Russian Federation.

17. The annex to this document contains a list of countries known to use the 106-style specification container primarily for chlorine, but also for other corrosive products. This list includes countries from all continents, although the use in Antarctica could not be checked.

### **Proposed modification to 6.2.2.1.8**

18. It is proposed to add one of the following text options following the title of the new standard in the new table found in 6.2.2.1.8:

#### **Option 1:**

*NOTE: Irrespective section 6.3.3.4 of this standard, welded steel gas pressure drums with dished ends convex to pressure may be used for the transport of corrosive substances provided all applicable requirements of these Regulations are met.*

#### **Option 2:**

*NOTE: Irrespective section 6.3.3.4 of this standard, welded steel gas pressure drums with dished ends convex to pressure may be used for the transport of corrosive substances provided all applicable requirements of these Regulations are met and its use is permitted by the competent authority in the country of use.*

## Annex

### Countries known to use or have used 106-style containers for corrosive substances

NOTE: Territories outside the metropolitan area have not been taken into account.

#### North America, Central America and Caribbean

- Bahamas
- Canada
- Costa Rica
- Dominican Republic
- El Salvador
- Guatemala
- Honduras
- Jamaica
- Mexico
- Nicaragua
- Panama
- Saint Lucia
- Trinidad and Tobago
- United States of America

#### South America:

- Argentina
- Bolivia
- Brazil
- Chile
- ColombiaEcuador
- Guyana
- Paraguay
- Peru
- Suriname
- Uruguay
- Venezuela

#### Asia:

- Bahrain
- Bangladesh
- Cambodia
- China
- India
- Japan
- Jordan
- Kuwait
- Malaysia
- Nepal
- Oman
- Pakistan
- Philippines
- Qatar
- Saudi Arabia

- Republic of Korea
- Sri Lanka
- Thailand
- United Arab Emirates
- Vietnam

Africa:

- Algeria
- Egypt
- Ethiopia
- Mauritius
- Nigeria
- South Africa
- Uganda
- Zambia
- Zimbabwe

Oceania:

Australia New ZealandEurope:

- Belgium
  - Cyprus
  - Denmark
  - France
  - Germany
  - Greece
  - Italy
  - Netherlands
  - Russian Federation
  - United Kingdom
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