



**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-first session**

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Item 5 (a) of the provisional agenda

**Miscellaneous proposals of amendments to the Model Regulations
on the Transport of Dangerous Goods: packagings****References to ISO Standards – Section 6.2.2****Submitted by the International Organization for Standardisation (ISO)¹****Introduction**

1. This paper proposes to introduce a new standard for the design construction and testing of UN bundles of cylinders and to replace the existing referenced version of ISO 11114-1 with the revised version published in 2012.

The standards concerned are:

ISO 10961:2010 Gas cylinders – Cylinder bundles – Design, manufacture, testing and inspection; and

ISO 11114-1:2012 Gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 1: Metallic materials

Proposal 1**Justification**

2. The standard ISO 10961:2010 fills a gap in the provisions for UN pressure receptacles which, although containing provisions for bundles of cylinders, has no standard

¹ In accordance with the programme of work of the Sub-Committee for 2011-2012 approved by the Committee at its fifth session (refer to ST/SG/AC.10/C.3/76 para. 116 and ST/SG/AC.10/38, para. 16)

referenced to enable construction. This standard gives type approval tests that ensure that the bundle of cylinders with its enclosing frame is robust enough to survive dropping and other mishandling in transport without leaking. The sub section on marking refillable pressure receptacles, 6.2.2.7, is applicable to the cylinders within the bundle, but is inappropriate for the bundle as a whole. The standard gives requirements for marking, but in common with other pressure receptacles, these requirements should be in the provisions of the Regulations, and marking requirements are included in this proposal for the Model Regulations.

This standard sets a higher standard, i.e. stronger frame and cylinder securing arrangements, than designs used national transport in many countries. The proposers believe that a robust design is appropriate for multi-modal and international journeys.

Proposed text

3. Amend the text of section 6.2.2 as follows.

After 6.2.2.1.5 insert a new paragraph.

“6.2.2.1.6 The standard shown below applies for the design, construction and initial inspection and test of UN bundles of cylinders. Each cylinder in a UN bundle of cylinders shall be a UN cylinder complying with the requirements of 6.2.2. The inspection requirements related to the conformity assessment system and approval for bundles of cylinders shall be in accordance with 6.2.2.5.

<i>Reference</i>	<i>Title</i>	<i>Applicable for manufacture</i>
ISO 10961:2010	Gas cylinders – Cylinder bundles – Design, manufacture, testing and inspection	Until further notice”

6.2.2.7 Amend the note to read as follows, (new text shown underlined):

“**NOTE:** *Marking requirements for UN metal hydride storage systems are given in 6.2.2.9 and marking requirements for UN bundles of cylinders are given in 6.2.2.10.*”

Delete 6.2.2.7.9 completely.

Add the following new 6.2.2.10:

“6.2.2.10 **Marking of bundles of cylinders**

6.2.2.10.1 Individual cylinders in a bundle of cylinders shall be marked in accordance with 6.2.2.7.

6.2.2.10.2 Refillable UN bundles of cylinders shall be marked clearly and legibly with certification, operational, and manufacturing marks. These marks shall be permanently affixed (e.g. stamped, engraved, or etched) on a plate permanently attached to the frame of the bundle of cylinders. Except for the UN packaging symbol, the minimum size of the marks shall be 5 mm. The minimum size of the UN packaging symbol shall be 10 mm.

6.2.2.10.3 The following marks shall be applied:

- (a) The certification marks specified in 6.2.2.7.2 (a), (b), (c), (d) and (e);
- (b) The operational marks specified in 6.2.2.7.3 (f), (i), (j) and the

total of the mass of the frame of the bundle and all permanently attached parts (cylinders, manifold, fittings and valves). Bundles intended for the carriage of UN 1001 acetylene, dissolved and UN 3374 acetylene, solvent free shall bear the tare mass as specified in clause B.4.2 of ISO 10961:2010; and

(c) The manufacturing marks specified in 6.2.2.7.4 (n), (o) and, where applicable, (p).

6.2.2.10.4 The marks shall be placed in three groups:

(a) The manufacturing marks shall be the top grouping and shall appear consecutively in the sequence given in 6.2.2.10.3 (c);

(b) The operational marks in 6.2.2.10.3 (b) shall be the middle grouping and the operational mark specified in 6.2.2.7.3 (f) shall be immediately preceded by the operational mark specified in 6.2.2.7.3 (i) when the latter is required;

(c) Certification marks shall be the bottom grouping and shall appear in the sequence given in 6.2.2.10.3 (a)."

Proposal 2

Justification

4. ISO 11114-1:1997 is referenced in the five places in the Model Regulations. This standard gives information on the compatibility of gases and the materials most commonly used for cylinders and their valves. It was criticised following the failure of an aluminium cylinder in Dubai. The 1997 version of the standard classifies combinations of gas and materials as either "acceptable" or "not recommended". "Not recommended" was defined as "a material/gas combination that may not be safe. Such combinations can be used where they have been assessed and authorized by a competent person who specifies the conditions of use".

This was thought to be too equivocal and could encourage fillers to ignore the requirements of the regulations. The 2012 version of the standard now classifies combinations of gas and material as either "acceptable" or "not acceptable". "Not acceptable" is defined as 'material/single gas combination that is not safe under all normal conditions of use'. The standard therefore has a closer conformity to the regulations.

The new standard also has new advice on the compatibility of mixtures of gases.

Proposed amendment

5. Replace "ISO 11114-1:1997" with "ISO 11114-1:2012" in the following paragraphs: 4.1.6.1.2, 6.2.2.2, 6.2.2.7.4 (p), 6.2.2.9.2 (j) and 6.7.5.2.4 (a).