

## 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

29 November 2010

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Item 5 of the provisional agenda

Electric storage systems

## Testing of lithium batteries and cells

### Transmitted by PRBA

1. PRBA is proposing several minor amendments to ST/SG/AC.10/C.3/2010/81 applicable to the lithium battery tests in Section 38.3 of the UN Manual of Tests and Criteria.

2. The working group on lithium batteries had discussed on two occasions a change to the definitions for *Large cell* and *Small cell* and agreed these definitions should be based on the mass of the cells rather than lithium content and Watt-hours. A final decision on the mass limit was not included in the final report ST/SG/AC.10/C.3/2010/81. PRBA is proposing that the distinction between *Small cell* and *Large cell* in Section 38.3.2.3 be based on a 150 g mass limit, which more accurately reflects the mass of cells currently on the market. The approximate mass of the most common cells on the market are listed below for reference. All of these cells except the Double D Lithium metal cells fall below 150 g.

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|------------------------------------|---------------------------------|
| - D Lithium metal (86 g and 100 g) | - CR 123A Lithium metal (17 g)  |
| - Double D Lithium metal (170 g)   | - 18650 Lithium ion (43 - 46 g) |
| - AA Lithium metal (14.5 g)        | - 17500 Lithium ion (25 g)      |
| - AAA Lithium metal (7.6 g)        |                                 |

3. Paragraph (f) in Section 38.3.3 and the paragraph that immediately follows it address the testing of battery assemblies. PRBA is proposing to delete the reference to “cell” in paragraph (f) in order to align it with the paragraph that immediately follows it. This will eliminate any confusion regarding the testing requirements for battery assemblies.

4. Section 38.3.3(e) specifies the Test 8 (T.8) Forced discharge testing requirements for primary and rechargeable cells and component cells. However, the number of required component cells subject to testing is not listed in 38.3.3(e) of ST/SG/AC.10/C.3/2010/81. PRBA is proposing to include the required number of component cells subject to testing.

## Proposals

5. In section 38.3.2.3, amend the definition of *Large cell* and *Small cell* by inserting 150 g in place of the bracketed [500 g]. The new definitions should read:

*Large cell* means a cell with a gross mass of more than 150 g.

*Small cell* means a cell with a gross mass of not more than 150 g.

6. In Section 38.3.3, delete “cells” from paragraph (f) as noted below:

(f) When testing a battery assembly in which the aggregate lithium content of all anodes, when fully charged, is not more than 500 g, or in the case of a lithium ion battery, with a Watt-hour rating of not more than 6200 Watt-hours, that is assembled from ~~cells or~~ batteries ....

7. In Section 38.3.3, amend paragraph (e) by adding provisions (ii), (iv) and (vi) and renumber existing provisions as necessary:

(e) When testing primary and rechargeable cells and component cells under test T.8, the following shall be tested in the quantity indicated:

- (i) Ten primary cells in fully discharged states;
- (ii) ten primary component cells in fully discharged states;
- (iii) ten rechargeable cells, at first cycle in fully discharged states;
- (iv) ten rechargeable component cells, at first cycle in fully discharged states;
- (v) ten rechargeable cells, after 50 cycles ending in fully discharged states; and
- (vi) ten rechargeable component cells, after 50 cycles ending in fully discharged states.

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