



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

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Item 4 (a) of the provisional agenda

Electric storage systems:

Testing of lithium batteries

Lithium ion batteries testing – amendment to the T.5 short circuit test

Submitted by the Advanced Rechargeable & Lithium Batteries Association (RECHARGE)*

I. Introduction

1. In previous Sub-Committee meetings, RECHARGE introduced the issue of the testing method according to the *Manual of Tests and Criteria* paragraph 38.3 applied to new batteries design that prevent the accession to the terminals (informal document INF.23 TDG Sub-Committee sixty-second session and informal document INF.48 TDG Sub-Committee sixty-third session).
2. Particularly, examples of batteries were provided including batteries for wireless charging, and high voltage modules protected by design. For all these cases, the usual method for testing the short circuit protection of the battery is not applicable, as the terminals are not accessible without dismantling the battery.
3. This dismantling of the battery protective components for the purpose of the test in principle prevents the possibility of demonstrating that these batteries are of a tested type, as the product would then not be tested as designed and as transported. In addition, the safety recommendation of the UN GTR clarifies that the protections cannot be dismantled for the test, particularly in the paragraph 6.2.5.3.1 about short circuit test:
“6.2.5.3.1 For testing with a complete REESS or REESS subsystem(s), at the beginning of the test, all protection devices which would affect the function of the Tested-Device and which are relevant to the outcome of the test shall be operational.”
4. When reviewing the possible options to verify that the batteries were correctly protected from short circuit risk, and ensure the safety in transport, it became clear that there was a need to dismantle the battery in order to have access to the terminals. This access to

* A/78/6 (Sect. 20), table 20.5.



the terminals is also applicable for the determination of the pass/fail criteria of tests T1 to T4, where a voltage measurement is required to demonstrate the voltage stability after the test.

5. It is recognized that the dismantling of the battery for a verification purpose, such as a voltage check, is not contradicting the safety management principles, as long as the dismantling method is applied following the manufacturer recommendations. Contrary to a non-protected short circuit test, this situation can be safely managed by the testing organizations, provided the relevant safety precautions are applied.

6. During the discussion of the sixty-third session of the Sub-Committee, it was recognized that a solution to this issue should be provided, and most experts who took the floor supported in principle the purpose of the proposal, but the proposal should be clarified. Concerns were raised particularly concerning the description of the cases where the solution proposed is applicable.

7. It is also possible to use a dismantling procedure to verify that the effectiveness of the short circuit protection by the protective parts has successfully passed the tests T1 to T4. This process would then enable a verification process to substitute the non-applicable short circuit test.

II. Conclusion

8. Some batteries are constructed in a way that prevents the application of a short circuit by design (wireless charging batteries, protected component-batteries with a design with no access to the electrical terminal) cannot be tested without removing parts included in the design. This situation in principle prevents the possibility of demonstrating that these batteries are of a tested type, because components that are part of the design should be removed for the test.

9. RECHARGE proposes to substitute a verification test to the non-applicable short circuit test, in order to verify that the protective parts preventing the short circuit are still effective after the whole test sequence T1 to T4.

III. Proposal

10. Add a new sub-paragraph at the end of the paragraph 38.3.3:

“h) Batteries that are of a design type

(i) including non-removable parts that protects against short circuit by preventing any access to the terminals, that can be used as such through wireless operations; or

(ii) including non-removable protective parts preventing any access to the terminals, that can be dismantled for final installation, and that are protected from short circuits by the complete battery or equipment or vehicle after final installation;

are not subject to T5 provided that a physical verification is made that such protective parts are still effective after the tests T1 to T4.

For these batteries, the verification process for the voltage stability criteria according to tests T1 to T4, may include a dismantling operation of the battery submitted to the tests, as indicated by the battery manufacturer, in order to provide access to voltage measurement points and verify the voltage stability criteria according to UN MT&C 38.3.4.”