

COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods

(Seventeenth session,
Geneva, 6-17 December 1999,
agenda item 5 (c))

MISCELLANEOUS DRAFT AMENDMENTS TO THE MODEL REGULATIONS
ON THE TRANSPORT OF DANGEROUS GOODS

Lithium batteries

editorial amendments to the proposal in INF 7

Transmitted by the expert from France

We propose following amendments to the proposal in INF 7 :

Special Provision 188

1) In § 1. Delete the words « with a non-zero charge »

« 1. Each lithium cell or battery ~~with a non-zero charge~~ must be designed or packaged in such a way as to prevent an external short circuit under normal conditions of transport. »

Justification :this precision is not necessary and might lead to confusion. Batteries with a « non zero charge » are already taken care off in § 8.

2) In § 4. Amend as follows :

« 4. Each lithium cell or battery is assigned to Category A, B, C or D according to the following table, where Q is the maximum amount of lithium or lithium equivalent content which is expected to be in the cell or battery at some point during its lifetime. Lithium content means the mass of lithium in the cell or battery. Lithium equivalent content means, for a lithium-ion cell ~~or battery~~, 0.3 times the rated capacity of the cell ~~or battery~~ in ampere-hours, with the result expressed as grams. **The lithium-equivalent content of a battery equals the sum of the grams of lithium-equivalent content contained in the component cells of the battery.** »

Justification : the definition of the lithium equivalent content is not complete and shall be the same as in 38.3.2 (page 11 of the INF document)

3) In the table the upper limit for batteries with a liquid cathode shall be 25 g

	Li content		Li equivalent content	
	Cell	Battery	Cell	Battery
Category A liquid cathode solid cathode	0 g < Q # 0.5 g 0 g < Q # 1 g	0 g < Q # 1 g 0 g < Q # 2 g	0 g < Q # 1.5 g	0 g < Q # 8 g
Category B liquid cathode solid cathode	0.5 g < Q # 5 g 1 g < Q # 5 g	1 g < Q # 25 g 2 g < Q # 25 g	1.5 g < Q # 8 g	8 g < Q # 40 g
Category C	5 g < Q # 15 g	25 g < Q # 750 g	8 g < Q # 25 g	40 g < Q # 1000 g

Category D	15 g < Q	750 g < Q	25 g < Q	1 000 g < Q
------------	----------	-----------	----------	-------------

UN/SCETDG/17/INF.21

page 2

Manual of test and criteria chap. 38.3

4) The definition of battery shall mention that the cells are electrically connected together

« Battery means two or more cells **electrically connected together**, including case, terminals, and marking »

5) In 38.3.4 Procedure and General Pass Conditions amend to read :

« (a) Each **sample of** cell and battery type must be subjected to tests ST.1 to ST.5 in sequence. »

Justification : In the proposed text it is not clear whether the sample of cells/batteries shall undergo all the tests in sequence or if you may use new cells/batteries for each test.

6) In 38.3.4.8.2 Test Procedure, the whole sentence is very complicated (even for experts !). for a better understanding we suggest to separate following paragraphs:

For primary cells and batteries, test cells and batteries are connected in a series string with undischarged primary cells and batteries of the same type.

For primary cells with nominal voltage of less than 2 volts and primary batteries containing component cells with a nominal voltage of less than 2 volts each, the total number of primary cells and batteries, including the test primary cell or battery, is defined by «18 volts/V», rounded up to the nearest whole number where V is the nominal voltage of one primary cell or battery.

For primary cells with nominal voltage of 2 volts or more, and primary batteries containing component cells with nominal voltage of 2 volts or more, the total number of primary cells or batteries in the series string, including the test primary cell or battery, is defined by «12volts/V», rounded up to the nearest whole number, where V is the nominal voltage of one primary cell or battery.

A resistive load is added to the series string of primary cells or batteries. The resistive load is such that the average current draw is the same as the maximum discharge current specified by the manufacturer. When this average current draw cannot be achieved employing this test procedure, the current draw required is the maximum current attainable according to this test procedure at the ambient temperature at which the test is performed.

However, when it is very difficult to specify the above load resistance, this test can also be performed by the constant current discharge method at the current specified as per the above, by using an external D.C. power source. The current is closed, discharging the test primary cell or battery. The test is continued from the time the circuit is closed until the voltage of the series string reaches 10% of its original open circuit voltage or 24 hours, whichever is longer.

7) Delete the last § in 38.3.4.8.2.

~~For a primary battery, the battery shall be discharged using a constant current of $0.2 I_r(A)$ until the battery circuitry terminates discharge or until the battery voltage reaches 0 V at an ambient temperature. ($I_r(A) = \text{Capacity (Ah)}/1(\text{hr})$.)~~

Justification : The whole procedure addresses both cells and batteries the last paragraph addressing only batteries is superfluous.
