

**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 of the provisional agenda

Electric storage systems

**Comments on ST/SG/AC.10/C.3/2010/33 and  
UN/SCETDG/37/INF.36**

**Electric Double Layer Capacitors (EDLCs)**

**Transmitted by the expert from the United States of America**

**Background**

1. During previous sessions, the Sub-Committee considered proposals related to the adoption of provisions for “ultracapacitors” (see ST/SG/AC.10/C.3/2009/13 and 2009/43). At the present session, documents ST/SG/AC.10/C.3/2010/33 and UN/SCETDG/37/INF.36 transmitted by Kilofarad International have also been submitted.

2. Taking into account discussions that have taken place during previous sessions, this paper is intended to provide an alternative to the proposals considered in 2010/33 and INF.36, and proposes the following:

- Adoption of a Class 9 entry for electric double layer capacitors;
- An appropriate level of regulation based on the capacitor’s maximum energy storage capacity;
- Performance testing requirements to ensure a high level of capacitor integrity;
- Appropriate packaging requirements which differentiate between capacitors transported separately and those installed in equipment.

**Proposal 1**

It is proposed that the following new entry for EDLCs be added to the Dangerous Goods List:

UN No.	Name and description	Class or division	Subsidiary risk	UN Packing group	Special provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
						(7a)	(7b)	Packing instructions	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
3XXX	CAPACITOR, electric double layer, with a maximum energy storage capacity exceeding .3 Wh	9			XXX	0	E0	P9XX			

## Proposal 2

It is proposed that the following special provision be added to Chapter 3.3:

XXX Each electric double layer capacitor design type shall be subjected to and shall pass the following tests:

- (a) A 1.2 m drop test onto an unyielding surface without loss of contents;
- (b) A 95 kPa pressure differential test without loss of contents; and
- (c) An internal pressure test demonstrating that the capacitor's outer casing is able to withstand 1.5 times the pressure buildup at the point of venting.

Each electric double layer capacitor shall be marked with its energy storage capacity expressed in Wh.

Electric double layer capacitors meeting the above conditions and with a maximum energy storage capacity of not more than [10 Wh] are not subject to these regulations provided they are transported in an uncharged state with the positive and negative terminals of each electric double layer capacitor or electric double layer capacitor module connected by an electrically conductive material. When installed in equipment, electric double layer capacitors meeting the above conditions are not subject to these Regulations provided they are packaged as required by Packing Instruction P9XX.

Electric double layer capacitors containing no dangerous goods and transported in an uncharged state are not subject to these Regulations.

## Proposal 3

It is proposed that the following new packing instruction be added to 4.1.4.1:

P9XX	PACKING INSTRUCTION	P9XX
	<p>This instruction applies to UN 3XXX</p> <p>The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>Packagings conforming to the packing group III performance level.</p> <p>When electric double layer capacitors are packed with equipment, they shall be packed in inner fibreboard packagings that meet the requirements for packing group III. When electric double layer capacitors are contained in equipment, the equipment shall be packed in strong outer packagings constructed of suitable material of adequate strength and design, in relation to the packagings capacity and its intended use in such a manner as to prevent accidental operation during transport. Large equipment containing capacitors contained in the equipment for the functioning of that equipment may be offered for transport unpackaged or on pallets when the electric double layer capacitor is afforded equivalent protection by the equipment in which it is contained.</p> <p><b>Additional requirements:</b></p> <p>Electric double layer capacitors shall be protected against short circuit.</p> <p>Except when contained in equipment, electric double layer capacitors shall be transported in an uncharged state with the positive and negative terminals of each electric double layer capacitor or electric double layer capacitor module connected by an electrically conductive material.</p>	