

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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LISTING, CLASSIFICATION AND PACKING

Testing of large batteries, modules and battery assemblies

Comment on ST/SG/AC.10/C.3/2008/46

Transmitted by the expert from Japan

INTRODUCTION

Recently, widespread use of electric and hybrid electric vehicles has been sought in many countries as a way of addressing environmental problems. Within these efforts, lithium-ion batteries are being widely considered by automobile makers for use as rechargeable energy storage system in hybrid electric vehicles, battery electric vehicles, and fuel cell vehicles.

Currently, transportation of automotive lithium-ion batteries is regulated under the UN3480 category; the same category as lithium batteries for consumer applications. However, the current definition of small lithium-ion batteries under UN3480 was created for batteries used in mobile devices, such as cellular phones and notebook computers, while the definition of large lithium-ion batteries was primarily formulated for fixed applications. This means that current classification does not cover automobile batteries as a primary subject for regulation.

There are following essential differences between lithium-ion batteries for automobiles and consumer applications.

Differences between Lithium-Ion Batteries for Automobiles and Consumer Applications

- Automobile batteries have a high energy capacity (Wh), volume, and mass compared to batteries for mobile devices.
- The vehicle traction or propulsion battery systems include monitoring and control systems in a battery made of electrically interconnected modules or battery cells, which monitor and control the battery conditions and state of charge. The batteries are

managed in conjunction with the vehicle control system under vehicle usage. A shutoff mechanism is also included for handling safety. Although the energy capacity, external form and mass differ depending on the design conditions of propulsion systems, the basic constructions of vehicle traction batteries are the same.

- The casing of battery packs is designed to have enough strength and to meet the severe endurance reliability required as vehicle part in terms of handling, transport, and installation in a vehicle.
- The battery packs, not only lithium ion batteries, receive careful attention as key precision component to avoid any damage during transport. In-vehicle batteries receive services designated by car makers, and their installation/de-installation and storage are conducted under controlled conditions.
- More than 1.5 million hybrid electric vehicles equipped with Ni-MH batteries have been sold and transported to date without any accident during transport for both the vehicles and batteries.

Differences in the Transportation of Lithium-Ion Batteries for Automobiles and Consumer Applications

- Automotive batteries are treated as automobile parts using specific transportation routes and methods for transportation between the cell factory and automobile factory, and for transportation of service parts.
- In practice, automotive batteries are limited to cargo transportation based on size and availability.

The extending spread of hybrid electric vehicles and future diffusion of battery electric vehicles, plug in hybrid electric vehicles, and fuel cell vehicles will result in high volume international transportation of automotive lithium-ion batteries. With these developments, it will be desirable to have regulations focused on the transportation of automotive lithium-ion batteries.

Support of the PRBA proposal ST/SG/AC.10/C.3/2008/46, 16 April 2008

In view of the background above, Japan generally supports the PRBA's proposal for the UN Manual of Test and Criteria, Chapter 38.3 for large lithium batteries, and will be committed to considering the appropriate and safe transport of lithium ion batteries, which is the key issue for further diffusion of hybrid and battery electric vehicle in the light of global environmental problems.

Modification proposal to the PRBA proposal ST/SG/AC.10/C.3/2008/46, 16 April 2008

Japan proposes the following modifications (add underlined words, and delete strike-through words) to the PRBA proposal ST/SG/AC.10/C.3/2008/46.

Page 4, Section 14, second paragraph

“*Battery assembly* means a battery system made of interconnected modules or batteries and includes ~~all~~ ancillary subsystems for mechanical support, ~~thermal management~~ monitoring, and electronic control.”

Page 4, Section 14, third paragraph

“*Large battery* means a lithium metal battery in which the aggregate lithium content of all anodes, when fully charged, is more than 80 g, or in the case of a lithium ion battery, means a battery, module or battery assembly with a Watt-hour rating of more than 600 Wh.”

Page 5, Section 14, second paragraph

“*Small battery* means a lithium metal battery composed of ~~small~~ cells, and in which the aggregate lithium content of all cell anodes, when fully charged, is not more than 80 g, or in the case of a lithium ion battery, means a battery, module or battery assembly with a Watt-hour rating of not more than 600 Wh.”

Page 7, Section 15, second paragraph

When batteries or battery modules that have passed ~~all~~ each applicable tests are electrically connected to form a battery assembly with an aggregate lithium content of all anodes, when fully charged, of more than 500 g, or in the case of a lithium ion battery, with a Watt-hour rating of more than 6200 Watt-hours, that battery assembly does not need to be tested if it is equipped with a system capable of monitoring and controlling the battery assembly and preventing short circuits, or over discharge between the batteries in the assembly and any overheat or overcharge of the battery assembly.”
