



Testing and Classification of Hybrid Lithium Batteries Containing Both Lithium Metal and Lithium Ion Cells and / or Batteries.

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New Hybrid Battery

- ▶ During the first meeting of the Informal Working Group, Tadiran presented a new Hybrid Battery containing
 - Primary Lithium (Metal) Cells/Batteries (major lithium/energy content), and
 - Rechargeable Lithium (Ion) Cells/Batteries (minor lithium/energy content)



Dittrich(Tadiran)
New Hybrid Battery

- ▶ The IWG requested guidance from the UN Experts on whether separate definitions and/or testing conditions are needed for this type of hybrid battery
- ▶ Several UN experts said that it would be useful to first consider whether the current test regime was appropriate for hybrid batteries or new tests should be developed for them.



New Hybrid Battery Proposed definition

Hybrid battery means a battery containing primary cells/batteries and rechargeable cells/batteries

which is not designed to be externally recharged and where the rechargeable cells/batteries are charged from the primary cells/batteries and where each rechargeable cell/battery is connected to a primary cell/battery not exceeding the open circuit voltage of the rechargeable cell/battery when fully charged.



New Hybrid Battery Proposed Testing

▶ *Proposal:*

When testing a hybrid battery, the primary component cells shall have passed the tests for primary cells and the rechargeable component cells shall have passed the tests for rechargeable cells and the hybrid battery shall be tested as a primary battery.

▶ *Reasoning:*

The combination of

- Component cell testing (including cycling and overcharging of rechargeable component cells)
- Limitation of the charge voltage (See proposed definition of *Hybrid Battery*)
- Testing the hybrid battery as a primary battery

is appropriate and sufficient. Different tests should not be developed for hybrid batteries.



New Hybrid Battery Proposed classification

- ▶ *Proposed classification:*
A hybrid battery is to be classified as a lithium metal battery
- ▶ *Reasoning:*
 - The predominant hazard is similar to that of a lithium metal battery
 - The hybrid battery is not rechargeable
 - The hybrid battery is inherently incapable of an overcharge due to the voltage relationship of the primary and rechargeable component cells.



Thank you.