EVS-03-21

For EVS-03-16

Initial Condition of SOC in Test Procedure

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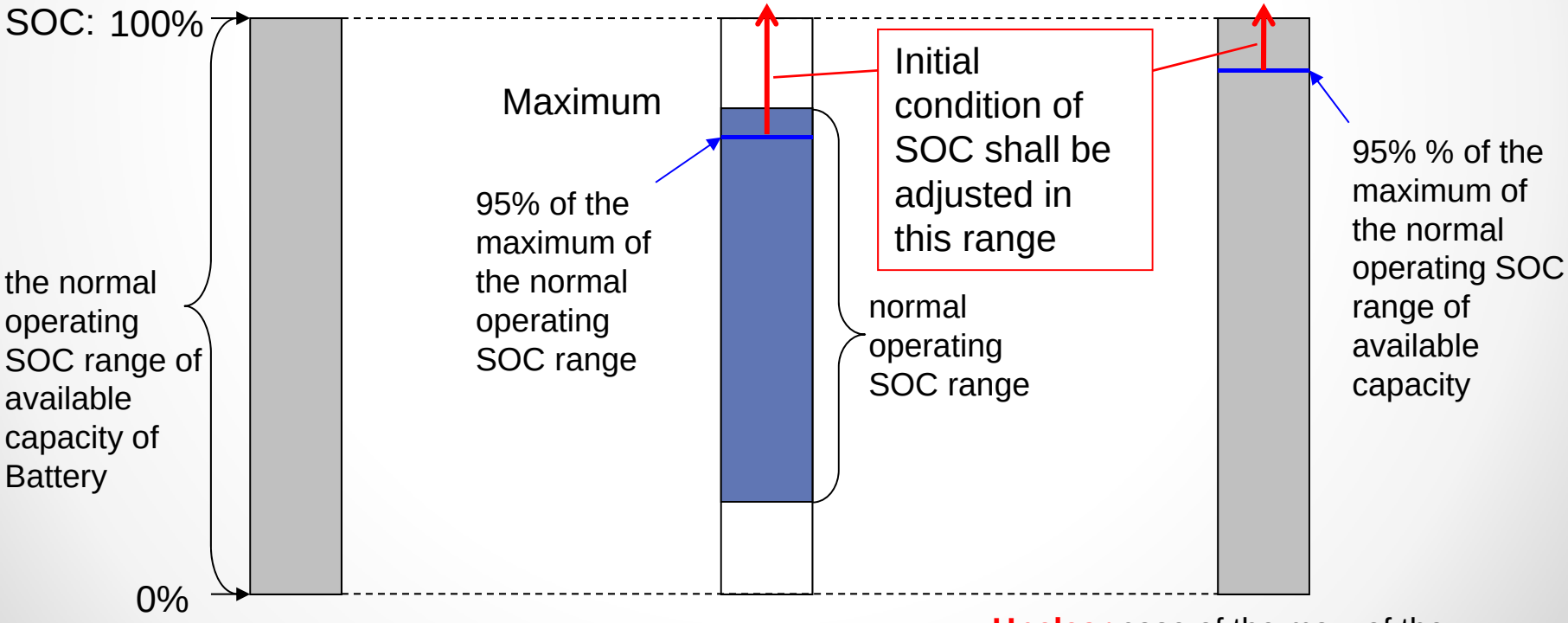
Jasic

Proposal

Initial condition of SOC

At the beginning of the test, the SOC shall be adjusted to a level of not less than 95% of the maximum of the normal operating SOC range of the Tested-Device at 20 ± 10 ° C. If the maximum of the normal operating SOC range is unclear, the SOC shall be adjusted to a level of not less than 95% of the maximum of the normal operating SOC range of available capacity of the Tested-Device at 20 ± 10 ° C.



Unclear case of the max. of the normal operating SOC range

Justification

- Since an electrical safety risk is high when the rechargeable storage energy reaches to the maximum level for the capacity of REESS, the test condition should require condition for reproducing such condition as possible.
- For li-ion batteries, in particular, the materials of the cell are required to assure the safety of the battery to be stable in physically, chemically and electrochemically in fully charge state. The SOC is one of the most important factors in determining response of a cell or pack to abusive events. (e.g. The magnitude degree of response of a cell to internal short circuit is influenced by SOC.)
- Given the repeatability and the manageability of the test in practice, the condition regarding a level of not less than 95% of the maximum of the normal operating SOC range of the Tested-Device is reasonable in practice. (Because it is uneasy to accurately adjust the SOC in order to fulfill.)

SOC Conditions of Other Regs and Stds. (ex.)

	Initial SOC						
	UN/ECE/Regulation No.100 series 02	UN ST/SG/AC.10/11/Rev.5/Amend.1 (UN 38.3)	ISO12405-1 (2011)	ISO12405-2 (2012)	IEC62660-2 (2010)	SAE J2929 (2011-02)	QC/T743-2006
Vibration test	The upper 50 per cent of the normal operating SOC range	SOC: Fully charged states (100%)	SOC: 50% (part1)	SOC: 50% (part1)	SOC: 100% (EV) 80 % (HEV)	SOC shall be at the maximum which is possible during normal vehicle operation throughout the entire test sequence. (SAE J 2380) or UN38.3 T.3	4.2×n [V] or according to the method defined by manufacturer (n: the number of cells in module)
Thermal Test	The upper 50 per cent of the normal operating SOC range	SOC: Fully charged states (100%)	SOC: 50%	SOC: 80%	SOC: w/o electrical operation 100% (EV), 80 % (HEV) W/ electrical operation 80% (EV), 60% (HEV)	SOC shall be at the maximum which is possible during normal vehicle operation. or UN38.3 [T.2]	-
Mechanical shock	The upper 50 per cent of the normal operating SOC range	SOC: Fully charged states (100%)	SOC: 50%	SOC: 50%	SOC: 100% (EV) 80% (HEV)	According to SAE J 2464 Section 4.3.1. or UN38.3 [T.4] SOC shall be at the maximum which is possible during normal vehicle operation.	-

Appendix

Ex. Test Procedure Plan (not Authorized)

Vehicle Based Test

- If the vehicle equipped with the external charge system, the Tested-Device is continued to charge until the full charge state which is judged by the vehicle.
- If the vehicle equipped without the external charge system, the manufacturer defines the maximum of the normal operating SOC range. The vehicle is driven for sufficient time to charge the Tested-Device to the maximum of the SOC by external power.
- At the start timing of test, the SOC should be kept a level of not less than 95% of the maximum.

Component Based Test

- If the manufacturer can provide the maximum of the normal operating SOC range, the Tested-Device is continued to charge until the maximum of the SOC.
- If the maximum of the normal operating SOC range is unclear, the SOC shall be adjusted to the maximum of the normal operating SOC range of available capacity of the Tested-Device .
- By the time a test is started, the SOC should be kept a level of not less than 95% of the maximum.