




문서번호	QAE-EF02-150305-PKASM PN SB10H45077	
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UN Test Report

- ASM P/N SB10H45077(Nom.91Wh, 11.4V)-

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2015. 03. 05



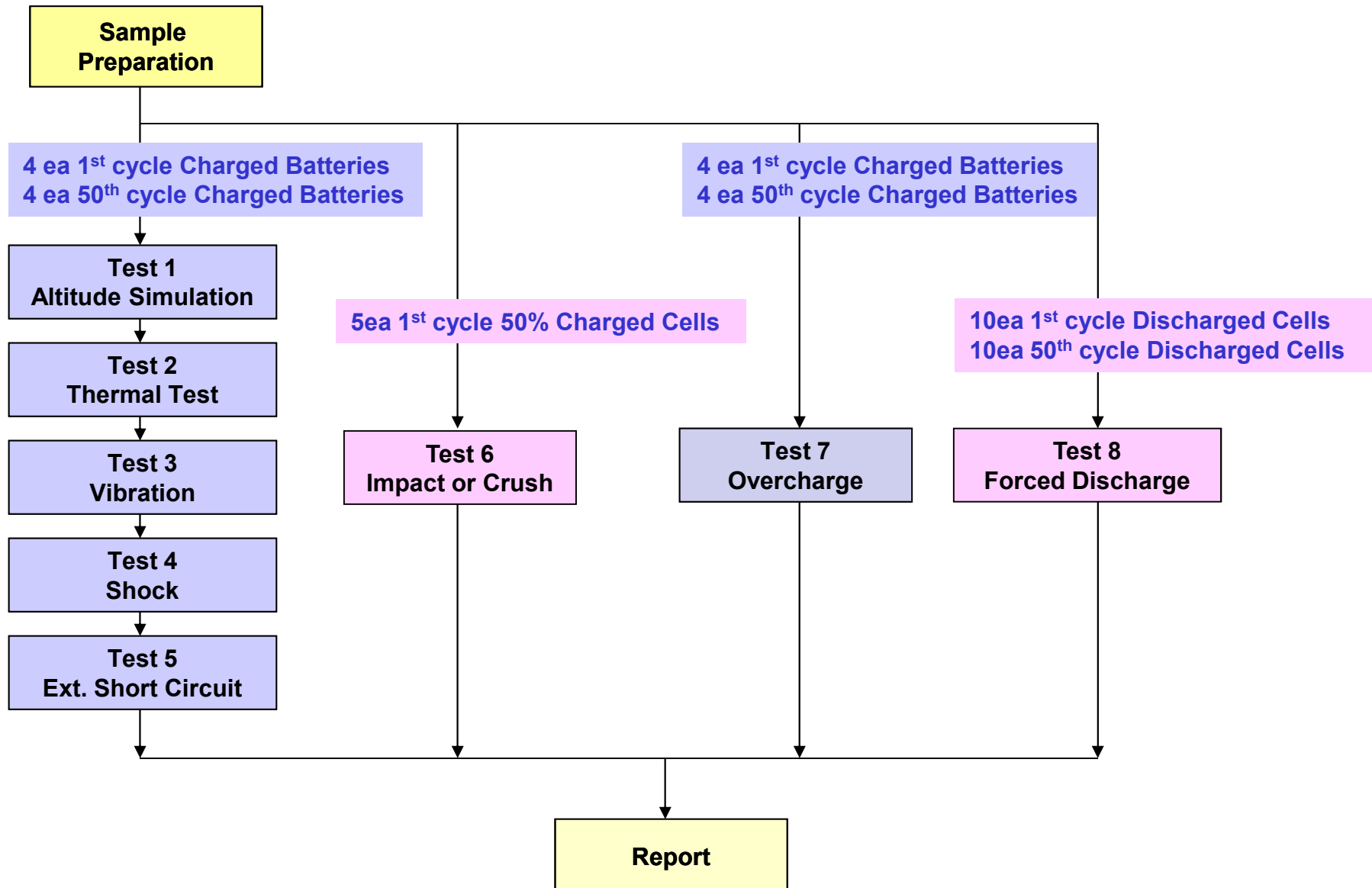
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5°C	- Measuring mass before/ after each test (If $M < 1g$, less than 0.5%, If $1g \leq M \leq 75g$, less than 0.2%, If $M > 75g$, less than 0.1%) - Measuring voltage before/ after each test (more than 90%) - No leakage, no venting, no disassembly, no rupture, no fire
Test 2. Thermal Test	[72±2°C, 6hr ↔ -40 ± 2°C, 6hr, interval max. 30min] x 10 cycle Storing at 20±5°C for 24h	
Test 3. Vibration	[7Hz ↔ 200Hz ↔ 7Hz, in 15min] x 12 times x 3 direction 1) sinusoidal waveform with a logarithmic sweep 2) 7Hz 18Hz (maintaining 1gn) app. 50Hz (until 8gn) 200Hz (maintaining 8gn), 1.6mm total excursion	
Test 4. Shock	Half sine shock (peak acceleration : 150gn, pulse duration : 6msec) x 6 (±x, y, z), direction x 3 cycle	
Test 5. External Short Circuit	100mΩ ext. short-circuit at 55±2°C 1hr continue after returning at 55±2°C	
Test 6. Impact for cylindrical cells (> 18mm diameter)	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height	
Test 6. Crush for cylindrical cells (≤ 18mm diameter) for prismatic, pouch, coin/button cells	Crushing rate : 1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation	
Test 7. Overcharge	Current = Manufacturer's recommended max. continuous charge current X 2 Voltage 1.If charge voltage ≤ 18V, V (min.) = 2 x (max. charge voltage) or V (min.) = 22V. 2.If charge voltage > 18V, V (min.) = 1.2 x (max. charge voltage)	
Test 8. Forced Discharge	Discharge at max. discharge current (with 12V DC power supply), Duration time = rated capacity/initial test current	

* Tests through T1-T5 shall be conducted in sequence with the same samples.

* We declare that the above-mentioned test is the result of being checked according to UN Test (Manual of Test and Criteria ST/SG/AC.10/11/Rev.5/Amd.2)

2. Test Procedure



3-1. T1-T4 Test Result

Before				Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
	NO.	OCV	Mass	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result

A. 1st cycle fully charged state

Charge	1	12.872	430.81	12.871	430.79	99.99	0.005	Pass	12.700	430.79	98.67	0.000	Pass	12.697	430.78	99.98	0.002	Pass	12.696	430.77	99.99	0.002	Pass
	2	12.848	430.96	12.845	430.95	99.98	0.002	Pass	12.677	430.95	98.69	0.000	Pass	12.672	430.93	99.96	0.005	Pass	12.668	430.92	99.97	0.002	Pass
	3	12.853	430.73	12.852	430.72	99.99	0.002	Pass	12.704	430.70	98.85	0.005	Pass	12.703	430.70	99.99	0.000	Pass	12.699	430.70	99.97	0.000	Pass
	4	12.854	431.00	12.852	430.98	99.98	0.005	Pass	12.690	430.98	98.74	0.000	Pass	12.689	430.96	99.99	0.005	Pass	12.688	430.94	99.99	0.005	Pass
	Ave.	12.857	430.88	12.855	430.86	99.99	0.003	-	12.693	430.86	98.74	0.001	-	12.690	430.84	99.98	0.003	-	12.688	430.83	99.98	0.002	-

B. 50th cycle fully charged state

Charge	5	12.852	430.50	12.851	430.50	99.99	0.000	Pass	12.701	430.46	98.83	0.009	Pass	12.700	430.45	99.99	0.002	Pass	12.695	430.44	99.96	0.002	Pass
	6	12.868	430.64	12.865	430.61	99.98	0.007	Pass	12.713	430.60	98.82	0.002	Pass	12.709	430.57	99.97	0.007	Pass	12.706	430.56	99.98	0.002	Pass
	7	12.855	430.28	12.851	430.28	99.97	0.000	Pass	12.690	430.27	98.75	0.002	Pass	12.687	430.26	99.98	0.002	Pass	12.687	430.24	100.00	0.005	Pass
	8	12.860	430.31	12.859	430.26	99.99	0.012	Pass	12.693	430.21	98.71	0.012	Pass	12.692	430.19	99.99	0.005	Pass	12.691	430.19	99.99	0.000	Pass
	Ave.	12.859	430.43	12.857	430.41	99.98	0.005	-	12.699	430.39	98.78	0.006	-	12.697	430.37	99.98	0.004	-	12.695	430.36	99.98	0.002	-

Requirement	<ul style="list-style-type: none"> - Measuring mass before/after each test (If $M > 75g$, less than 0.1%, $1g \leq M \leq 75$, less than 0.2%, $M < 1g$, less than 0.5%) - Measuring voltage before/after each test (more than 90%, only charged samples) - No leakage, no venting, no disassembly, no rupture, no fire
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3-2. T5/T7 Test Result

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully charged state

Charge	1	12.696	56.43	Pass
	2	12.668	55.06	Pass
	3	12.699	56.10	Pass
	4	12.688	56.65	Pass
	MAX.	12.699	56.65	-

Test Condition
- 100mΩ ext. short-circuit at 55±2°C

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully charged state

Charge	9	12.850	23.52	Pass
	10	12.841	23.87	Pass
	11	12.843	24.14	Pass
	12	12.840	23.31	Pass
	MAX.	12.850	24.14	-

Test Condition
- Max. Charge Current : 5446mA - CC/CV 2Imax(10892mA) 22V cut-off 24Hr

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

B. 50th cycle fully charged state

Charge	5	12.695	56.75	Pass
	6	12.706	54.93	Pass
	7	12.687	56.31	Pass
	8	12.691	55.04	Pass
	MAX.	12.706	56.75	-

Requirement
- Temperature ≤ 170 (°C) - No disassembly, no rupture, no fire within 6 hours after the test

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (°C)	Result

B. 50th cycle fully charged state

Charge	13	12.820	24.31	Pass
	14	12.820	23.72	Pass
	15	12.830	23.45	Pass
	16	12.828	23.63	Pass
	MAX.	12.830	24.31	-

Requirement
- No disassembly, no fire within 7 day after the test

3-3. T6/T8 Test Result (ICP596766L1)

Crush (T6)				
Direction	NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle 50% charged state

Flat	C-1	3.745	23.22	Pass
	C-2	3.751	22.73	Pass
	C-3	3.749	23.12	Pass
	C-4	3.755	23.40	Pass
	C-5	3.749	23.15	Pass
MAX.		3.755	23.40	-

Test Condition
- Crushing rate : 1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation

Requirement
- Temperature ≤ 170 (°C)
- No disassembly, no fire within 6 hours after the test

Forced Discharge (T8)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully discharged state

C-6	3.140	47.51	Pass
C-7	3.145	49.02	Pass
C-8	3.144	46.92	Pass
C-9	3.143	49.16	Pass
C-10	3.138	47.30	Pass
C-11	3.139	49.39	Pass
C-12	3.138	48.23	Pass
C-13	3.137	48.42	Pass
C-14	3.136	46.95	Pass
C-15	3.142	47.76	Pass
MAX.	3.145	49.39	-

B. 50th cycle fully discharged state

C-16	3.141	46.23	Pass
C-17	3.147	46.37	Pass
C-18	3.148	46.21	Pass
C-19	3.149	46.13	Pass
C-20	3.139	45.59	Pass
C-21	3.145	45.62	Pass
C-22	3.138	46.28	Pass
C-23	3.142	45.46	Pass
C-24	3.141	45.66	Pass
C-25	3.140	45.63	Pass
MAX.	3.149	46.37	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 3890mA Duration time: rated capacity (60min)

Requirement
- No disassembly, no fire within 7 days after the test

4. Sample Image





LG Chem, Ltd.

188, Moonji-ro, Yuseong-gu, Daejeon, 305-738

Declaration

We, LG Chem, Ltd. hereby declares, that the product

Product Name : **Rechargeable Li-ion Battery Pack**

Regulatory Model Number : **SB10H45077**

Based on the request of SRICI, LG Chem, Ltd. submits a letter of authorization regarding below changes have no impact on UN38.3 test report. LG Chem, Ltd. confirms all specifications are identical except for below changes.

Changes	
-. Change the capacity value to 90Wh from 91Wh on the label.	
Before	
After	

Date: July 14th, 2016

Name / Title: Dae Ho Nam / Senior Manager