

문서번호	QAE-EF02-111104-PKASMP/N45N1058,1062	
Prepared	김홍일	
	남익현	
	장승현	
Reviewed	남대호	
	이재승	
Approved	정준용	

Solution*Partner*

UN Test Report

-ASM P/N 45N1058,ASM P/N 45N1062-

-(Nom. 63Wh, 11.1V)-

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 **LG Chem**
Mobile Energy Division

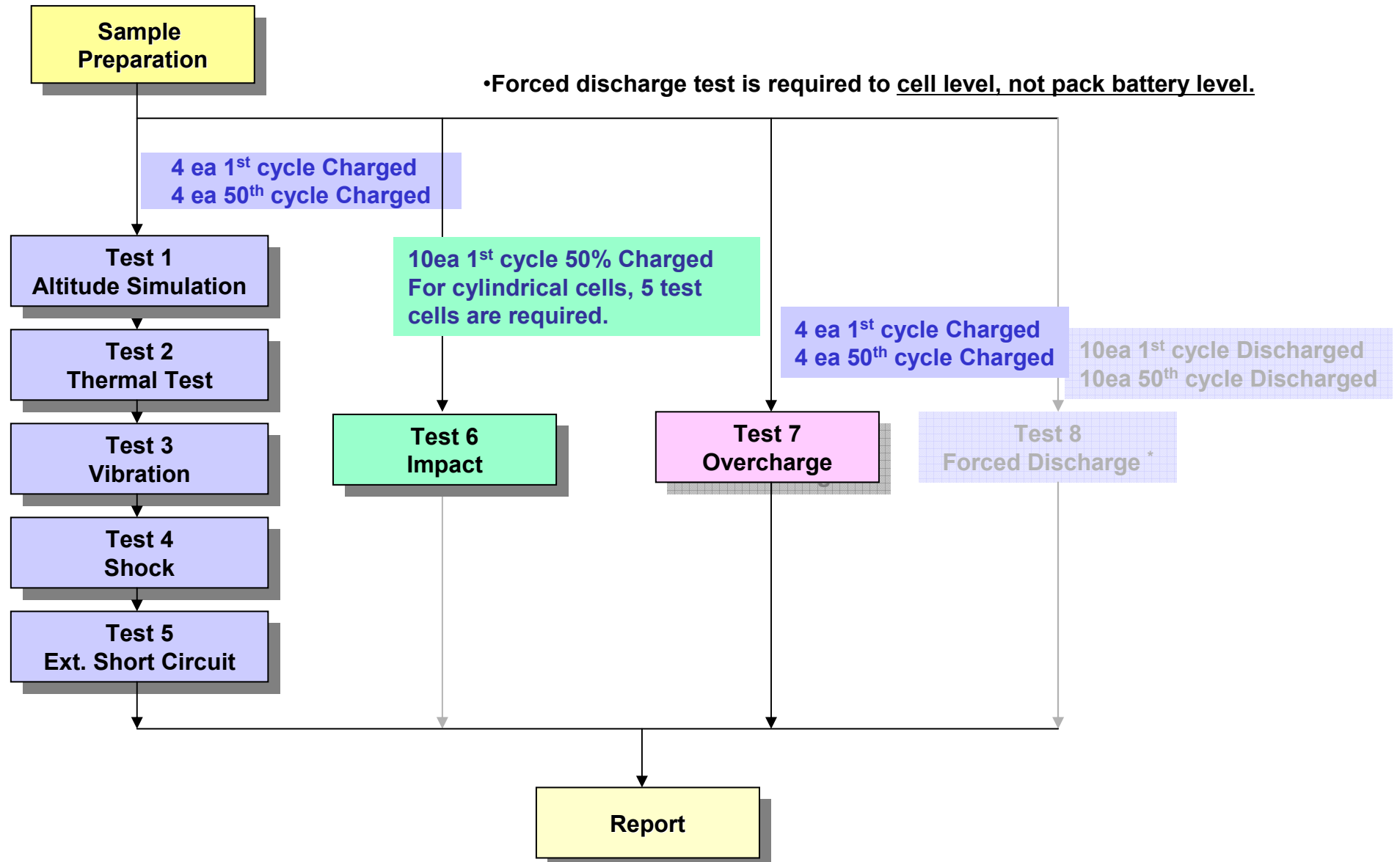
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- Measuring mass before/ after each test (If M>5g, 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	[75±2℃,6hr ↔ -40±2℃,6hr,interval max. 30min] x 10cycle Storing at 20±5℃ 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℃ 1hr continue after returning at 55±2℃	- No disassembly, no rupture, no fire (after 6 hours) - Temp. monitoring (max. 170℃)
Test 6. Impact	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height	
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)	- No disassembly, no fire (after 7 days)
Test 8. Forced Discharge	Only for Cell, not battery.	- No disassembly, no fire (after 7 days)

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

* 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)

2. Test Procedure



3-1. T1-T4 Test Result

Before				Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
	Pack	OCV	Mass	OCV	Mass	Residual	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result
	NO.					OCV(%)																	
A. 1st cycle fully state																							
Charge	1	12.669	322.95	12.667	322.95	99.99	0.001	Pass	12.549	322.94	99.07	0.005	Pass	12.546	322.94	99.98	0.003	Pass	12.544	322.93	99.99	0.008	Pass
	2	12.696	323.32	12.695	323.31	99.99	0.005	Pass	12.544	323.31	98.81	0.003	Pass	12.544	323.31	99.99	0.000	Pass	12.542	323.30	99.98	0.005	Pass
	3	12.683	323.63	12.681	323.63	99.99	0.002	Pass	12.540	323.62	98.89	0.006	Pass	12.538	323.62	99.99	0.001	Pass	12.538	323.62	100.00	0.007	Pass
	4	12.674	323.13	12.673	323.12	99.99	0.008	Pass	12.530	323.12	98.87	0.004	Pass	12.528	323.12	99.99	0.002	Pass	12.527	323.11	99.99	0.004	Pass
	Ave.	12.680	323.26	12.679	323.25	99.990	0.004	-	12.541	323.25	98.908	0.004	-	12.539	323.25	99.99	0.001	-	12.538	323.24	99.99	0.006	-
B. 50th cycle fully state																							
Charge	5	12.627	323.85	12.626	323.84	99.99	0.004	Pass	12.498	323.84	98.98	0.005	Pass	12.496	323.84	99.99	0.001	Pass	12.494	323.83	99.99	0.003	Pass
	6	12.602	323.62	12.602	323.62	100.00	0.001	Pass	12.459	323.62	98.87	0.002	Pass	12.458	323.62	99.99	0.000	Pass	12.458	323.62	100.00	0.002	Pass
	7	12.636	322.49	12.635	322.49	99.99	0.005	Pass	12.485	322.49	98.81	0.003	Pass	12.484	322.49	99.99	0.001	Pass	12.483	322.48	100.00	0.002	Pass
	8	12.621	323.26	12.621	323.25	100.00	0.004	Pass	12.488	323.24	98.95	0.010	Pass	12.488	323.24	100.00	0.002	Pass	12.486	323.24	99.99	0.001	Pass
	Ave.	12.621	323.30	12.621	323.30	99.99	0.003	-	12.482	323.30	98.90	0.005	-	12.482	323.30	99.99	0.001	-	12.481	323.29	99.99	0.002	-

3-2. T5/T7 Test Result

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

A. 1st cycle fully state

Charge	1	12.544	55.9	Pass
	2	12.542	55.1	Pass
	3	12.538	55.5	Pass
	4	12.527	55.9	Pass
	MAX.	12.544	55.9	-

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

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

A. 1st cycle fully state

Charge	9	12.662	22.9	Pass
	10	12.658	22.3	Pass
	11	12.687	23.1	Pass
	12	12.681	22.8	Pass
	MAX.	12.687	23.1	-

Test Condition				
- Max. Charge Current : 3800 mA - CC/CV 2Imax(7600mA) 22V cut-off 24Hr				

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

B. 50th cycle fully state

Charge	5	12.494	55.1	Pass
	6	12.458	55.4	Pass
	7	12.483	55.6	Pass
	8	12.486	55.7	Pass
	MAX.	12.494	55.7	-

Requirement				
- Temperature < 170 (°C) - No disassembly, no rupture, no fire within 6 hours				

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

B. 50th cycle fully state

Charge	13	12.613	23.1	Pass
	14	12.637	22.7	Pass
	15	12.617	22.9	Pass
	16	12.621	22.2	Pass
	MAX.	12.637	23.1	-

Requirement				
- No disassembly, no fire within 7 day				

3-3. T6 Test Result (ICR18650C2)

Impact (T6)			
Pack NO.	Initial OCV(V)	Max. Temp (°C)	Result
A. 1st cycle 50% charge state			
C-1	3.807	25.43	Pass
C-2	3.807	108.50	Pass
C-3	3.806	24.36	Pass
C-4	3.806	24.79	Pass
C-5	3.806	114.39	Pass
MAX.	3.807	114.39	-
B. 50th cycle fully discharge state			
C-6	3.351	24.83	Pass
C-7	3.362	46.43	Pass
C-8	3.387	49.26	Pass
C-9	3.369	49.90	Pass
C-10	3.353	47.55	Pass
MAX.	3.387	49.90	-
Test Condition			
- Φ =15.8mm bar, 9.1kg mass, 61±2.5cm height			
Requirement			
- Temperature < 170 (°C) - No disassembly, no rupture, no fire within 6 hours			

4. Sample Image

ASM P/N 45N1062



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