문서번호	QAE-EF02-151214-B-SB10K97566	
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UN38.3 Test Report
- SB10K97566 (Nom.56Wh, 15.2V)-

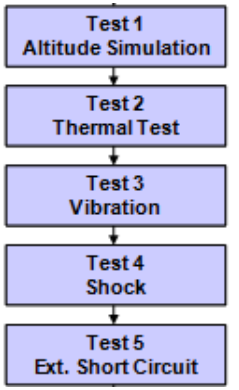
목 차

2015. 12. 14

LG Chem

1. UN38.3 Test Condition

Rev.5 / Amd.2

Test item	Test Condition	Requirements	Etc.
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- After OCV (%) ≥ 90% - No leakage, no venting, no disassembly, no rupture, no fire - Mass loss limit (leakage) 1) If M<1g, less than 0.5%, 2) If 1g≤M≤75g, less than 0.2%, 3) If M>75g, less than 0.1%	T1~T5 : Sequence Tests 
Test 2. Thermal Test	[72±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 within 6 hours after the test - Max. Temp ≤ 170℃	
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	- No disassembly, no fire within 6 hours after the test - Max. Temp ≤ 170℃	for cylindrical cells (not less than 18mm diameter)
Test 6. Crush	Crushing rate :1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation		for cylindrical cells (less than 18mm diameter) for prismatic, pouch, coin/button cells
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 22V. 2.If charge voltage > 18V, V (min.) = 1.2 x (max. charge voltage)	- No disassembly, no fire within 7 days after the test	Only for Single Cell Battery / Battery
Test 8. Forced Discharge	Discharge at max. discharge current (connecting in series with 12V DC power supply), Duration time = rated capacity/initial test current	- No disassembly, no fire within 7 days after the test	Resistance of Electric Loader 1/Ω = (max. discharge current) / (12 + Initial OCV)

2-1. T1-T4 Test Result

Before			Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
NO.	OCV	Mass (g)	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result	After OCV (V)	Mass (g)	After OCV(%)	Mass Loss(%)	Result
A. 1st cycle fully charged state																						
1	17.321	254.01	17.319	254.00	99.99	0.004	**Pass**	17.083	253.98	98.64	0.008	**Pass**	17.081	253.97	99.99	0.004	**Pass**	17.074	253.96	99.96	0.004	**Pass**
2	17.302	253.97	17.295	253.96	99.96	0.004	**Pass**	17.084	253.93	98.78	0.012	**Pass**	17.082	253.91	99.99	0.008	**Pass**	17.075	253.91	99.96	0.000	**Pass**
3	17.314	253.90	17.312	253.89	99.99	0.004	**Pass**	17.080	253.87	98.66	0.008	**Pass**	17.073	253.84	99.96	0.012	**Pass**	17.071	253.83	99.99	0.004	**Pass**
4	17.322	253.78	17.319	253.77	99.98	0.004	**Pass**	17.120	253.75	98.85	0.008	**Pass**	17.111	253.73	99.95	0.008	**Pass**	17.104	253.72	99.96	0.004	**Pass**
B. 50th cycle fully charged state																						
5	17.309	253.87	17.302	253.87	99.96	0.000	**Pass**	17.101	253.84	98.84	0.012	**Pass**	17.096	253.81	99.97	0.012	**Pass**	17.096	253.80	100.00	0.004	**Pass**
6	17.298	253.81	17.298	253.80	100.00	0.004	**Pass**	17.078	253.78	98.73	0.008	**Pass**	17.073	253.77	99.97	0.004	**Pass**	17.064	253.76	99.95	0.004	**Pass**
7	17.302	258.38	17.300	258.37	99.99	0.004	**Pass**	17.075	258.36	98.70	0.004	**Pass**	17.068	258.33	99.96	0.012	**Pass**	17.063	258.33	99.97	0.000	**Pass**
8	17.291	253.82	17.286	253.81	99.97	0.004	**Pass**	17.051	253.78	98.64	0.012	**Pass**	17.046	253.78	99.97	0.000	**Pass**	17.037	253.77	99.95	0.004	**Pass**

2-2. T5/T7 Test Result

EXT.Short Circuit (T5)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
1	17.074	55.47	Pass
2	17.075	55.66	Pass
3	17.071	56.12	Pass
4	17.104	54.39	Pass
B. 50th cycle fully charged state			
5	17.096	55.81	Pass
6	17.064	55.89	Pass
7	17.063	55.47	Pass
8	17.037	54.82	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
9	17.345	26.04	Pass
10	17.349	25.88	Pass
11	17.343	25.73	Pass
12	17.340	25.23	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully charged state			
13	17.325	25.17	Pass
14	17.328	25.33	Pass
15	17.326	25.81	Pass
16	17.326	25.53	Pass

2-3. T6/T8 Test Result (ICP3948125A1)

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state			
C-1	3.849	23.44	**Pass**
C-2	3.853	23.49	**Pass**
C-3	3.847	23.38	**Pass**
C-4	3.854	23.47	**Pass**
C-5	3.850	23.43	**Pass**

Forced Discharge (T8)

NO.	Initial OCV(V)	Max. Temp (℃)	Result	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully discharged state				**B. 50th cycle fully discharged state**			
C-6	3.012	47.56	**Pass**	**C-16**	3.115	43.46	**Pass**
C-7	3.007	46.43	**Pass**	**C-17**	3.117	46.52	**Pass**
C-8	3.010	47.48	**Pass**	**C-18**	3.121	46.80	**Pass**
C-9	3.011	48.55	**Pass**	**C-19**	3.130	43.24	**Pass**
C-10	3.017	47.54	**Pass**	**C-20**	3.127	44.67	**Pass**
C-11	3.011	47.30	**Pass**	**C-21**	3.113	47.32	**Pass**
C-12	3.014	46.59	**Pass**	**C-22**	3.125	43.17	**Pass**
C-13	3.009	45.37	**Pass**	**C-23**	3.118	44.28	**Pass**
C-14	3.013	45.11	**Pass**	**C-24**	3.117	45.14	**Pass**
C-15	3.012	47.08	**Pass**	**C-25**	3.124	44.30	**Pass**

3. Sample Image