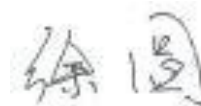


UN38.3 Test Summary

The following product has been evaluated according to the 6th revised edition Amendment 1 of the UN Manual of Tests and Criteria.
We, LG Chem, Ltd., hereby certify that this battery meets the requirements of the regulation for transportation of lithium-ion cells, batteries and single cell batteries.

Manufacture's contact information	LG Chem, Ltd. 128 Yeoui-Daero, Yeongdeungpo-gu, SEOUL, 150-721, REPUBLIC OF KOREA Telephone : +86-10-7742-5427 E-mail : kkammy@lgchem.com Website : www.lgchem.com		
Test Laboratory information	LG Chem, Ltd. / RESEARCH PARK 188 Munjiro, Yuseong-gu, Daejeon, 305-738, REPUBLIC OF KOREA Telephone : +82-10-3099-3724 E-mail : juhongpark@lgchem.com Website : www.lgchem.com		
	LG Chem (Nanjing) I&E Materials Co., Ltd NO.17 Hengyi Road, Nanjing Economic & Technological Development Zone, Nanjing, Jiangsu, China Telephone : +86-025-85603000-8288 E-mail : xuyuannj@lgchem.com Website : www.lgchem.com		
Description		List of Test Completed	
Test Report Number	QDI-191009-SB-EB-BA715ABY L	Test 1. Altitude Simulation	Pass
Date of test report	2019.10.09	Test 2. Thermal Test	Pass
Model name	EB-BA715ABY L	Test 3. Vibration	Pass
Type	Pouch (Lithium ion battery)	Test 4. Shock	Pass
Nominal voltage	3.85 V	Test 5. External Short Circuit	Pass
Capacity	17.33Wh	Test 6. Impact or Crush	Pass
Weight	61.690g	Test 7. Overcharge	Pass
Dimensions	82.55mmX64.33mmX4.85mm	Test 8. Forced Discharge	Pass

Approved By: Yuan Xu
 Part Leader
 Cyl NPI&CE lab part DQA Team
 LG Chem, Ltd.
 E-mail: xuyuannj@lgchem.com



Document Number	QDI-191009-SB-EB-BA715ABY L	
Prepared	qianjunli	钱俊丽
Approved	Xuyuan	徐园

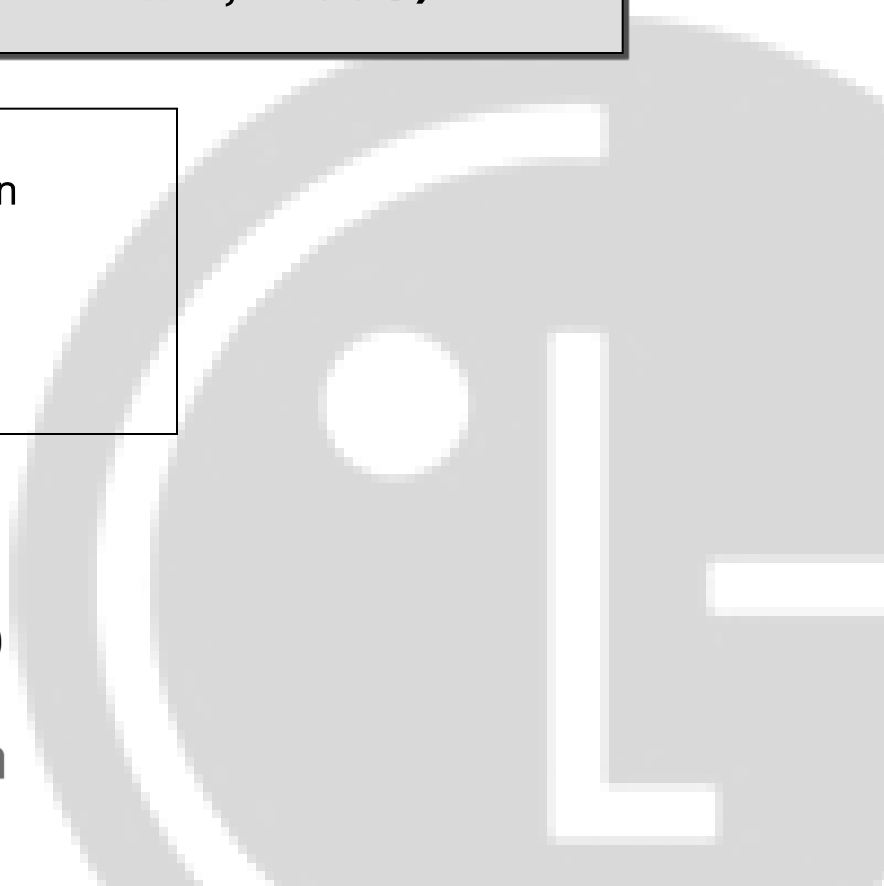
UN38.3 Test Report

- EB-BA715ABY L (Nom. 17.33Wh, 3.85V) -

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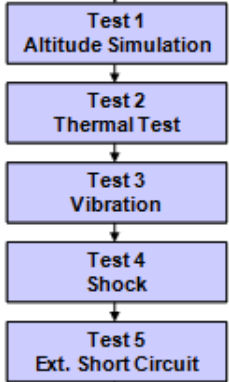
- 1. UN38.3 Test Condition
- 2. Test Result
- 3. Sample Image

2019. 10. 09



1. UN38.3 Test Condition

Rev.6 Amendment 1

Test item	Test Condition	Requirements	Etc.
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5℃	<ul style="list-style-type: none"> - After OCV (%) ≥ 90% - No leakage, no venting, no disassembly, no rupture, no fire - Mass loss limit (leakage) <ul style="list-style-type: none"> 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  <pre> graph TD T1[Test 1 Altitude Simulation] --> T2[Test 2 Thermal Test] T2 --> T3[Test 3 Vibration] T3 --> T4[Test 4 Shock] T4 --> T5[Test 5 Ext. Short Circuit] </pre>
Test 2. Thermal Test	[72±2℃, 6hr ↔ -40±2℃, 6hr, interval max. 30min] x 10 cycle 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 1) Peak acceleration - For cells & single cell batteries : 150gn - For batteries (whichever is smaller) : 150gn or 100gn 2) Pulse duration : 6m sec 3) 6 direction (±x, y, z) x 3 cycle		
Test 5. External Short Circuit	1) Samples to be heated to 57±4℃ in chamber (Measured on external case) 2) Less than 0.1Ω, ext. short-circuit at 57±4℃ 3) 1hr continue after returning to 57±4℃		
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	4.3199	61.690	4.3192	61.689	99.98	0.002	Pass	4.2603	61.681	98.64	0.013	Pass	4.2600	61.683	99.99	0.000	Pass	4.2598	61.679	100.00	0.006	Pass
2	4.3214	61.463	4.3208	61.462	99.99	0.002	Pass	4.2605	61.455	98.60	0.011	Pass	4.2600	61.454	99.99	0.002	Pass	4.2600	61.453	100.00	0.002	Pass
3	4.3219	61.616	4.3213	61.616	99.99	0.000	Pass	4.2609	61.610	98.60	0.010	Pass	4.2606	61.608	99.99	0.003	Pass	4.2604	61.609	100.00	0.000	Pass
4	4.3193	61.427	4.3187	61.428	99.99	0.000	Pass	4.2585	61.418	98.61	0.016	Pass	4.2580	61.419	99.99	0.000	Pass	4.2581	61.419	100.00	0.000	Pass
5	4.3214	61.527	4.3208	61.527	99.99	0.000	Pass	4.2600	61.518	98.59	0.015	Pass	4.2596	61.520	99.99	0.000	Pass	4.2596	61.519	100.00	0.002	Pass

B. 25th cycle fully charged state

6	4.3285	61.668	4.3282	61.667	99.99	0.002	Pass	4.2675	61.660	98.60	0.011	Pass	4.2670	61.662	99.99	0.000	Pass	4.2670	61.661	100.00	0.002	Pass
7	4.3317	61.646	4.3314	61.645	99.99	0.002	Pass	4.2700	61.639	98.58	0.010	Pass	4.2696	61.642	99.99	0.000	Pass	4.2696	61.642	100.00	0.000	Pass
8	4.3317	61.650	4.3314	61.649	99.99	0.002	Pass	4.2694	61.643	98.57	0.010	Pass	4.2691	61.644	99.99	0.000	Pass	4.2690	61.646	100.00	0.000	Pass
9	4.3314	61.567	4.3310	61.565	99.99	0.003	Pass	4.2698	61.558	98.59	0.011	Pass	4.2694	61.561	99.99	0.000	Pass	4.2693	61.562	100.00	0.000	Pass
10	4.3315	61.624	4.3312	61.622	99.99	0.003	Pass	4.2703	61.617	98.59	0.008	Pass	4.2700	61.617	99.99	0.000	Pass	4.2698	61.619	100.00	0.000	Pass

2-2. T5/T7 Test Result

EXT.Short Circuit (T5)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle fully charged state

1	4.2598	58.18	Pass
2	4.2600	58.21	Pass
3	4.2604	57.62	Pass
4	4.2581	57.19	Pass
5	4.2596	56.81	Pass

B. 25th cycle fully charged state

6	4.2670	58.02	Pass
7	4.2696	58.05	Pass
8	4.2690	57.51	Pass
9	4.2693	57.02	Pass
10	4.2698	56.44	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
-----	----------------	----------------	--------

A. 1st cycle fully charged state

11	4.3186	24.50	Pass
12	4.3130	25.00	Pass
13	4.3229	24.40	Pass
14	4.3190	24.50	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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B. 25th cycle fully charged state

15	4.3303	24.49	Pass
16	4.3297	24.50	Pass
17	4.3327	24.59	Pass
18	4.3288	24.29	Pass

2-3. T6/T8 Test Result (P486582A1)

Cell Document Number

QDI-191007-C-P486582A1

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle 50% charged state

C-1	3.8509	22.85	Pass
C-2	3.8521	22.91	Pass
C-3	3.8516	22.36	Pass
C-4	3.8509	22.77	Pass
C-5	3.8505	22.72	Pass

B. 25st cycle 50% charged state

C-6	3.8763	22.36	Pass
C-7	3.8747	22.54	Pass
C-8	3.8773	22.26	Pass
C-9	3.8743	23.76	Pass
C-10	3.8760	23.77	Pass

Forced Discharge (T8)

NO.	Initial OCV(V)	Max. Temp (°C)	Result	NO.	Initial OCV(V)	Max. Temp (°C)	Result
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A. 1st cycle fully discharged state

C-6	3.4641	65.35	Pass	C-16	3.4717	66.84	Pass
C-7	3.4649	64.52	Pass	C-17	3.4779	65.91	Pass
C-8	3.4636	64.61	Pass	C-18	3.4674	65.40	Pass
C-9	3.4636	62.34	Pass	C-19	3.4709	68.97	Pass
C-10	3.4656	62.56	Pass	C-20	3.4782	65.79	Pass
C-11	3.4645	62.30	Pass	C-21	3.4788	68.55	Pass
C-12	3.4620	64.94	Pass	C-22	3.4784	64.52	Pass
C-13	3.4687	63.51	Pass	C-23	3.4726	63.45	Pass
C-14	3.4653	63.67	Pass	C-24	3.4711	69.90	Pass
C-15	3.4659	66.18	Pass	C-25	3.5002	66.70	Pass

B. 25th cycle fully discharged state

3. Sample Image

