

UN38.3 Test Summary

The following product has been evaluated according to the 6th revised edition 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.

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	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-170222-B-L16L4PB2	Test 1. Altitude Simulation	Pass
Date of test report	2017.02.22	Test 2. Thermal Test	Pass
Model name	L16L4PB2	Test 3. Vibration	Pass
Type	Pouch	Test 4. Shock	Pass
Nominal voltage	15.2 V	Test 5. External Short Circuit	Pass
Capacity	55.0 Wh	Test 6. Impact or Crush	Pass
Weight	247.0 g	Test 7. Overcharge	Pass
Dimensions	288.00mm X 112.00mm X 5.90mm	Test 8. Forced Discharge	Pass

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Document Number	QDI-170222-B-L16L4PB2	
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UN38.3 Test Report

- L16L4PB2 (Nom.55Wh, 15.2V) -

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2017. 02. 22



1. UN38.3 Test Condition

Rev.6

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) <ol 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% 	<p>T1~T5 : Sequence Tests</p> <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 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 1) Peak acceleration - For cells & single cell batteries : 150gn - For batteries (whichever is smaller) : 150gn or $\sqrt{\frac{100850}{Mass(kg)}} gn$ 2) Pulse duration : 6msec 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. General Information

1. Standard charge / discharge Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 3630 mA Voltage = 17.4 V	Current = 181 mA
Discharge	CC	Current = 726 mA	Voltage = 12.8 V

2. Cycle Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 3630 mA Voltage = 17.4 V	Current = 181 mA
Discharge	CC	Current = 726 mA	Voltage = 12.8 V

3. Test Condition

	Mode	Condition
Test 7. Overcharge	CC / CV	Max. Charge Current = 3630 mA CC/CV 2Imax (7.26A) 22V cut-off 24Hr
Test 8. Forced Discharge	CC	Max. Discharge Current = 3630 mA Duration Time = 60 min

3-1. 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	17.371	246.53	17.351	246.52	99.88	0.004	Pass	17.178	246.51	99.00	0.004	Pass	16.981	246.49	98.85	0.008	Pass	16.689	246.48	98.28	0.004	Pass
2	17.359	246.63	17.333	246.62	99.85	0.004	Pass	17.159	246.61	99.00	0.004	Pass	16.961	246.58	98.85	0.012	Pass	16.663	246.56	98.24	0.008	Pass
3	17.347	246.65	17.322	246.64	99.86	0.004	Pass	17.161	246.63	99.07	0.004	Pass	16.962	246.59	98.84	0.016	Pass	16.671	246.58	98.28	0.004	Pass
4	17.356	246.61	17.331	246.59	99.86	0.008	Pass	17.158	246.58	99.00	0.004	Pass	16.961	246.57	98.85	0.004	Pass	16.671	246.56	98.29	0.004	Pass

B. 50th cycle fully charged state

5	17.368	246.77	17.345	246.77	99.87	0.007	Pass	17.186	246.76	99.08	0.004	Pass	16.991	246.75	98.87	0.004	Pass	16.687	246.73	98.21	0.008	Pass
6	17.365	246.66	17.342	246.64	99.87	0.006	Pass	17.173	246.64	99.03	0.000	Pass	16.977	246.61	98.86	0.012	Pass	16.683	246.58	98.27	0.012	Pass
7	17.352	246.61	17.333	246.61	99.89	0.006	Pass	17.169	246.60	99.05	0.004	Pass	16.965	246.59	98.81	0.004	Pass	16.675	246.57	98.29	0.008	Pass
8	17.363	246.63	17.347	246.61	99.91	0.015	Pass	17.188	246.60	99.08	0.004	Pass	16.991	246.59	98.85	0.004	Pass	16.701	246.57	98.29	0.008	Pass

* The test was conducted again due to add Ni-plates on BMU.

3-2. 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	16.689	55.38	Pass
2	16.663	53.50	Pass
3	16.671	55.41	Pass
4	16.671	53.94	Pass

B. 50th cycle fully charged state

5	16.687	54.69	Pass
6	16.683	53.58	Pass
7	16.675	53.77	Pass
8	16.701	54.92	Pass

Over Charge (T7)

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

9	17.340	24.87	Pass
10	17.349	25.61	Pass
11	17.342	25.97	Pass
12	17.347	24.40	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (°C)	Result
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B. 50th cycle fully charged state

13	17.321	25.66	Pass
14	17.328	26.26	Pass
15	17.325	24.94	Pass
16	17.323	25.12	Pass

3-3. T6/T8 Test Result (ICP465275L1)

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

A. 1st cycle 50% charged state

C-1	3.815	22.53	Pass
C-2	3.824	22.91	Pass
C-3	3.816	23.40	Pass
C-4	3.824	22.60	Pass
C-5	3.819	23.26	Pass

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

A. 1st cycle fully discharged state

C-6	3.058	42.98	Pass
C-7	3.059	44.21	Pass
C-8	3.068	44.11	Pass
C-9	3.064	42.84	Pass
C-10	3.059	42.70	Pass
C-11	3.063	43.76	Pass
C-12	3.059	41.95	Pass
C-13	3.058	42.39	Pass
C-14	3.065	41.24	Pass
C-15	3.059	41.52	Pass

B. 50th cycle fully discharged state

C-16	3.115	43.74	Pass
C-17	3.085	42.28	Pass
C-18	3.107	43.46	Pass
C-19	3.108	43.91	Pass
C-20	3.101	44.62	Pass
C-21	3.116	43.07	Pass
C-22	3.060	43.87	Pass
C-23	3.114	44.10	Pass
C-24	3.061	44.44	Pass
C-25	3.066	43.71	Pass

4. Sample Image



Lenovo

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 Rechargeable Li-ion Battery
 锂离子电池组 4ICP5/55/90
 Model Name (型号/型号): L16L4PB2
 Manufactured By LGC
 Cell made in China
 Pack processed in China
 制造地：中国 / 製造地：中国
 制造商：LG Chem, Ltd.

Rating: 15.2V \pm TYP. 3618mAh/55Wh MIN. 3486mAh/53Wh
 STORE BETWEEN 0°C-60°C 32°F-140°F
 For use with Lenovo personal computer
 EU contact : Lenovo, Einsteinova 21, 851 01 Bratislava, Slovakia
 CAUTION : Replace with same type only.
 Use of another battery may present a fire or explosion
 PLEASE REFER TO USER MANUAL OR FOLLOW LOCAL ORDINANCES AND/OR REGULATIONS FOR DISPOSAL
 请参考使用说明书或者遵循相关法律法规规定处理废弃电池
 额定容量 : 3486mAh 充电限制电压 : 17.4V



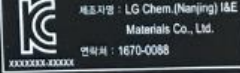
TIS 2217-2548
 Lenovo (Thailand) Limited



R39088
 15.2V/3486mAh
 二次锂离子电池



EU 3486mAh
 MH29581 LNA



15.2V 3486mAh
 レノボ・ジャパン株式会社
 制造商 : LG Chem (Nanjing) I&E Materials Co., Ltd.
 연락처 : 1670-0088



RECYCLE
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Li-ion 00
 使用後はリサイクルへ



EU

⚠ FARE: MÅ IKKE ÅPNES ELLER UTSETTES FOR VÄRME ÖVER 100°C
 PELIGRO: NO ABRIR O EXPONER A TEMPERATURAS SUPERIORES A 100°C
 PERIGO: NÃO ABRIR NEM EXPOR A TEMPERATURAS SUPERIORES A 100°C
 PERIGO: NÃO ABRA OU EXPOHA A AQUECIMENTO ACIMA DE 100°C
 VORSICHT! NICHT REPARIEREN ODER ZERLEGEN. MIT WASSER IN BERÜHRUNG BRINGEN ODER ÜBER 100°C ERHITZEN
 DANGER: DO NOT OPEN OR EXPOSE TO HEAT ABOVE 100°C
 DANGER! NE PAS OUVRIR NI EXPOSER À PLUS DE 100°C
 GEVAAR! NIET OPENEN. NIET BLOOTSTELLEN. AAN TEMPERATUREN BOVEN 100°C

FARLIG: MÅ IKKE ÅPNES ELLER UDSÆTTES FOR TEMPERATUREN ÖVER 100°C
 ATTENZIONE! NON APRIRE O RISCALDARE AD UNA TEMPERATURA SUPERIORE AI 100°C
 FARA: ÖPPNA INTE BATTERIET OCH UTSÄTT DET INTE FÖR VÄRME ÖVER 100°C
 VAARA: ÄLÄ AVARA ANKKA ÄLÄÄ KOLMENNÄ OITA KU 100 ASTEEN LÄMPÖTILAN
 危険 発熱、発火、破裂の恐れがあるため、修理等は行わないでください。
 ●修理等を行う場合はバッテリーパックは、廃棄物とさせていただきます。
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 ●異常な充電が原因で発熱や発火をしないで行ってください。
 ●バッテリーパックの金属端子をショート（短絡）させないでください。

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 務必按照說明處置用完的電池

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