

### UN38.3 试验概要 UN38.3 Test Summary



812000400270406

	单位信息 Comj	pany information							
委托单位 Consignor	委托单位 Consignor 乐金化学(南京)信息电子材料有限公司 LG Chem(Nanjing) I&E Materials Co.,Ltd 南京经济技术开发区恒谊路 17 号 NO 17 HENGYI RD NANJING ECONOMICAL & TECHNICAL DEVELOPMENT ZONE								
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	电池信息 Batt	tery information							
名称 Name	锂离子电池	品牌 Brand	/						
型号 Type	L18L3P71	原始测试型号 Original tested type	L18L3P71						
标称电压(V) Nominal voltage	11.58	容量/能量 Capacity/energy	TYP:4922mAh 57Wh Rated:4708mAh 55Wh						
描述 Description	可充电锂离子电池组 Rechargeable Li-jon battery	锂含量(g) Li content							
质量(kg) Mass	0.232	外观 Appearance	黑色塑胶及塑料薄膜外壳 Black plastics cement and plastics film shell						
	测试信息 Te	est information							
原报告编号 Original test report No.	QDI-180803-B-L18L3P71	测试报告日期 Date of test report	2018-08-03						
测试标准 Test standard	联合国《关于危险货物运输的 册》第38.3章 UNITED NATIOI the TRANSPORT OF DANGEF of Tests and Criteria 38.3	J建议书 试验和标准手 NS "Recommendations on ROUS GOODS" Manual	ST/SG/AC.10/11/Rev.6/Ame nd.1						
T.1 高度模拟 Altitude simulation	合格 Passed	T.2 温度测试 Thermal test	合格 Passed						
T.3 振动测试 Vibration	合格 Passed	T.4 冲击测试 Shock	合格 Passed						
T.5 外部短路 External short circuit	合格 Passed	T.6 挤压 Crush	合格 Passed						
T.7 过度充电 Overcharge	合格 Passed	T.8 强制放电 Forced discharge	合格 Passed						
38.3.3 (f)	/	38.3.3 (g)	/						



上海化工院检测有限公司







-验证码:564473-

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### 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.

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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 : <u>www.lgchem.com</u>							
Descr	iption	List of Test	Completed					
Test Report Number	QDI-180803-B-L18L3P71	Test 1. Altitude Simulation	Pass					
Date of test report	2018.08.03	Test 2. Thermal Test	Pass					
Model name	L18L3P71	Test 3. Vibration	Pass					
Туре	Pouch	Test 4. Shock	Pass					
Nominal voltage	11.58 V	Test 5. External Short Circuit	Pass					
Capacity	57.00Wh	Test 6. Impact or Crush	Pass					
Weight	231.85g	Test 7. Overcharge	Pass					
Dimensions	271.20mmX92.60mmX5.45mm	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-180803-B-	L18L3P71
Prepared	qianjunli	海陵丽
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## UN38.3 Test Report - L18L3P71 (Nom. 57.00Wh, 11.58V) -

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2018.08.03



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# 1. UN38.3 Test Condition

**LG** Chem

**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 ັC		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 1 Altitude Simulation
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	<ul> <li>After OCV (%) ≥ 90%</li> <li>No leakage, no venting, no disassembly, no rupture, no fire</li> <li>Mass loss limit (leakage)</li> <li>1) If M&lt;1q. less than 0.5%.</li> </ul>	Test 2 Thermal Test Test 3
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	2) If 1g≤M≤75g, less than 0.2%, 3) If M>75g, less than 0.1%)	Vibration Test 4 Shock Test 5 Ext. Short Circuit
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℃	- No disassembly, no rupture, no fire within 6 hours after the test - Max. Temp ≤ 170 ℃	
Test 6. Impact	Φ=15.8 $\pm$ 0.1mm bar, 9.1 $\pm$ 0.1kg mass, 61 $\pm$ 2.5cm height	- No disassembly, no fire	for cylindrical cells (not less than 18mm diameter)
Test 6. Crush	Crushing rate :1.5cm/s, until 13kN $\pm$ 0.78kN or 100mV drop or 50% deformation	within 6 hours after the test - Max. Temp ≤ 170 ℃	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			Alt	itude (	T1)			The	ermal (	(T2)			Vib	ration	(T3)			Sh	ock (1	<sup>-</sup> 4)	
NO.	OCV	Mass	OCV	Mass	After OCV(%)	Mass Los s(%)	Result	OCV	Mass	After OCV(%)	Mass Los s(%)	Result	OCV	Mass	After OCV(%)	Mass Los s(%)	Result	OCV	Mass	After OCV(%)	Mass Los s(%)	Result
<u>A. 1st cy</u>	cle fully a	charged	state	-																		
1	13.0271	231.60	13.0236	231.57	99.97	0.013	Pass	12.8062	231.52	98.33	0.022	Pass	12.8004	231.54	99.95	0.000	Pass	12.7995	231.53	99.99	0.004	Pass
2	13.0295	231.34	13.0257	231.30	99.97	0.017	Pass	12.8085	231.25	98.33	0.022	Pass	12.8025	231.27	99.95	0.000	Pass	12.8018	231.26	99.99	0.004	Pass
3	13.0281	231.38	13.0243	231.34	99.97	0.017	Pass	12.8049	231.30	98.32	0.017	Pass	12.7986	231.31	99.95	0.000	Pass	12.7980	231.30	100.00	0.004	Pass
4	13.0232	231.75	13.0200	231.73	99.98	0.009	Pass	12.8043	231.67	98.34	0.026	Pass	12.7981	231.69	99.95	0.000	Pass	12.7975	231.68	100.00	0.004	Pass
B. 50th c	ycle fully	charged	l state		1			1	1													I
5	12.9907	230.71	12.9907	230.70	100.00	0.004	Pass	12.7985	230.65	98.52	0.022	Pass	12.7924	230.67	99.95	0.000	Pass	12.7918	230.67	100.00	0.000	Pass
6	12.9928	231.85	12.9931	231.84	100.00	0.004	Pass	12.8033	231.79	98.54	0.022	Pass	12.7973	231.80	99.95	0.000	Pass	12.7966	231.80	99.99	0.000	Pass
7	12.9985	231.19	12.9984	231.17	100.00	0.009	Pass	12.8047	231.13	98.51	0.017	Pass	12.7988	231.15	99.95	0.000	Pass	12.7979	231.15	99.99	0.000	Pass
8	12.9973	231.12	12.9973	231.10	100.00	0.009	Pass	12.8032	231.05	98.51	0.022	Pass	12.7976	231.07	99.96	0.000	Pass	12.7966	231.06	99.99	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	12.7995	58.38	Pass
2	12.8018	58.14	Pass
3	12.7980	57.75	Pass
4	12.7975	57.45	Pass

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

### A. 1st cycle fully charged state

9	13.0248	21.80	Pass
10	13.0259	21.59	Pass
11	13.0307	21.59	Pass
12	13.0286	21.84	Pass

#### B. 50th cycle fully charged state

5	12.7918	58.31	Pass
6	12.7966	58.17	Pass
7	12.7979	57.72	Pass
8	12.7966	57.51	Pass

#### B. 50th cycle fully charged state

13	12.9988	21.59	Pass
14	12.9729	21.19	Pass
15	12.9999	21.45	Pass
16	12.9880	21.19	Pass



# 2-3. T6/T8 Test Result (ICP478873L1)

### **Cell Document Number**

QDI-160908-C-ICP478873L1

Crush (T6)					Forced Discharge (T8)						
NO.	Initial OCV(V)	Max. Temp (℃)	Result	NO.	Initial OCV(V)	Max. Temp (℃)	Result	NO.	Initial OCV(V)	Max. Temp (℃)	Result
<u>A. 1st (</u>	cycle 50% char	ged state		<u>A. 1st</u>	cycle fully disc	harged state		<u>B. 50th</u>	cycle fully dis	charged state	
C-1	3.864	22.06	Pass	C-6	3.017	41.15	Pass	C-16	3.080	41.19	Pass
C-2	3.861	22.98	Pass	C-7	3.027	42.45	Pass	C-17	3.077	40.98	Pass
C-3	3.860	22.79	Pass	C-8	3.045	44.61	Pass	C-18	3.057	44.85	Pass
C-4	3.864	22.06	Pass	C-9	3.050	44.41	Pass	C-19	3.062	43.64	Pass
C-5	3.863	22.34	Pass	C-10	3.013	43.02	Pass	C-20	3.100	44.92	Pass
				C-11	3.025	41.41	Pass	C-21	3.099	44.23	Pass
				C-12	3.023	43.56	Pass	C-22	3.068	40.18	Pass
				C-13	3.018	43.82	Pass	C-23	3.097	40.41	Pass
				C-14	3.010	40.69	Pass	C-24	3.081	44.53	Pass
				C-15	3.035	43.95	Pass	C-25	3.067	40.82	Pass



## 3. Sample Image





Document Number	QDI-180803-B-L18L3P71-D1	
Prepared	qianjunli	藏腹所
Approved	Xuyuan	413

## 1.2m Drop Test Report - L18L3P71 (Nom. 57.00Wh, 11.58V) -

2018.08.03



### 1.2m Drop Test Report

A. Test Information

Standard requirement or The Clause Number of Standard	Test Condition		Requirement
UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(18 <sup>th</sup> ) special provisions 188	<ul> <li>1.2m Box Drop</li> <li>1st drop : corner</li> <li>2nd drop : flat on the bottom</li> <li>3rd drop : flat on the top</li> <li>4th drop : flat on the long side</li> <li>5th drop : flat on the short side</li> </ul>	Corner	Without ; - Damage to cells or batteries contained therein - Shifting of the contents so as to allow battery to battery (or cell to cell) contact - Release of contents

#### B. Box Information

Dimensions	383x305x215 mm	Battery Quantity	30 pcs/Box
Gross weight	8.800 kg	Net Weight of Batteries	6.956 kg

#### C. Image

**LG** Chem



D. <u>Test Result</u>

Result	Result Detail	
PASS	The box was not cracked, the contents were not damaged and not shifted.	