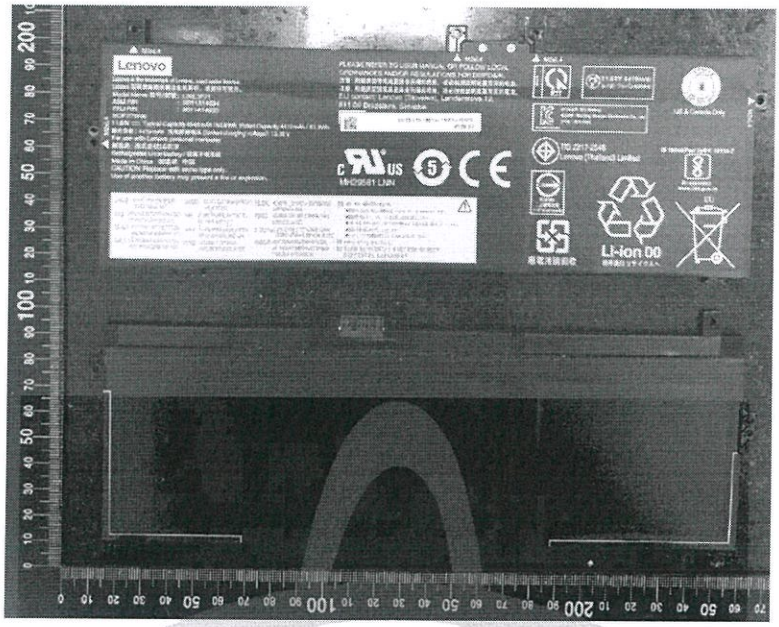
UN38.3 试验概要
UN38.3 Test Summary

812000400060306

单位信息 Company information			
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 025-85603000 zhanghonglu@lgchem.com www.lgchem.com		
生产单位 Manufacturer	南京莱斯康电子有限公司 Nan Jing Nexcon Electronics Co.,Ltd 南京经济技术开发区栖霞街道刀枪河路 11 号 No.11, Daoqianghe Road, Economic & Technical Development Zone East Side, Qixia Area, Nanjing City, Jiangsu Province, China 15895891460 caolijun132x@nexcontech.net http://www.nexcontech.com/		
测试单位 Test lab	LG Chem, ltd. LG Chem, ltd. 韩国首尔市永登浦区汝矣大道 128 号 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea 010-77425427 kkammy@lgchem.com www.lgchem.com		
电池信息 Battery information			
名称 Name	锂离子电池	品牌 Brand	/
型号 Type	L20L3P71	原始测试型号 Original tested type	/
标称电压(V) Nominal voltage	11.61	容量/能量 Capacity/energy	Typical Capacity:4548mAh 52.8Wh/Rated Capacity:4419mAh 51.3Wh
描述 Description	可充电锂离子电池组 Rechargeable Li-ion battery	锂含量(g) Li content	/
质量(kg) Mass	0.201	外观 Appearance	黑色塑料薄膜外壳 Black plastic film shell
测试信息 Test information			
原报告编号 Original test report No.	QDI-200806-B-L20L3P71	测试报告日期 Date of test report	2020-08-06
测试标准 Test standard	联合国《关于危险货物运输的建议书 试验和标准手册》第 38.3 章 UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria 38.3		ST/SG/AC.10/11/Rev.6/Amend.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)	/

样品图片 Sample Picture



结论 Conclusion	测试样品符合联合国《关于危险货物运输的建议书试验和标准手册》ST/SG/AC.10/11/Rev.6/Amend.1 38.3 标准要求。The tested samples meet the requirements of test items of the UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3
备注 Remark	/
签名 Signature 职务 Title	王寅 副总工程师 Vice chief engineer
签发日期 Issued date	2020-08-17

-验证码:372323-

报告结束

UN38.3 Test Summary

Manufacturer's contact information	LG Chem, ltd. 128 Yeoui-Daero, Yeongdeungpo-gu, SEOUL, 150-721, REPUBLIC OF KOREA Telephone : +82-10-7742-5427 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 : +86-025-85603000-8231 E-mail : njliying@lgchem.com Website : www.lgchem.com

Description		List of Test Completed	
Cell/Battery Type (Physical Description)	Lithium Ion battery pack (Pouch)	Revised edition	Revision 6 Amendment 1
Test Report Number	QDI-200806-B-L20L3P71	Test 1. Altitude Simulation	Pass
Date of test report	2020.08.06	Test 2. Thermal Test	Pass
Model name	P467970A1	Test 3. Vibration	Pass
Nominal voltage (V)	11.61	Test 4. Shock	Pass
Capacity (Nominal Wh)	52.80	Test 5. External Short Circuit	Pass
Weight (g)	200.0	Test 6. Impact or Crush	Pass
Dimensions (mm)	254.20 X 82.80 X 8.30	Test 7. Overcharge	Pass
Reference to assembled battery testing requirements	Not applicable	Test 8. Forced Discharge	Pass

Reviewed By: Juhong Park
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Approved By: DaeHo Nam
Team Leader
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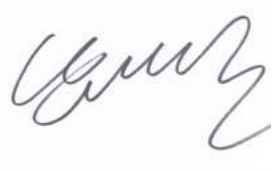


Document Number	QDI-200806-B-L20L3P71	
Prepared	Taecheon Kim	
Reviewed	Juhong Park	
Approved	DaeHo Nam	

UN38.3 Test Report
- L20L3P71 (Nom.52.8Wh, 11.61V)-

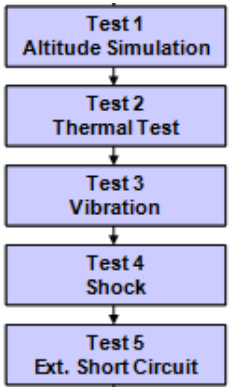
Index

2020. 08. 06

LG Chem

1. UN38.3 Test Condition

Rev.6 Amendment 1

<table>
<tr><th>Test item</th><th>Test Condition</th><th>Requirements</th><th>Etc.</th></tr>
<tr><td>Test 1. Altitude Simulation</td><td>Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃</td><td rowspan="4">- 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%)</td><td rowspan="5">T1~T5 : Sequence Tests
  </td></tr>
<tr><td>Test 2. Thermal Test</td><td>[72±2℃,6hr ↔ -40±2℃,6hr, interval max. 30min] x 10cycle
Storing at 20±5℃ for 24h</td></tr>
<tr><td>Test 3. Vibration</td><td>[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</td></tr>
<tr><td>Test 4. Shock</td><td>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</td></tr>
<tr><td>Test 5. External Short Circuit</td><td>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℃</td><td>- No disassembly, no rupture, no fire within 6 hours after the test
- Max. Temp ≤ 170℃</td></tr>
<tr><td>Test 6. Impact</td><td>Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height</td><td rowspan="2">- No disassembly, no fire within 6 hours after the test
- Max. Temp ≤ 170℃</td><td>for cylindrical cells
(dia ≥ 18mm)</td></tr>
<tr><td>Test 6. Crush</td><td>Crushing rate :1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation</td><td>for cylindrical cells
(dia < 18mm)
for prismatic, pouch, coin/button cells</td></tr>
<tr><td>Test 7. Overcharge</td><td>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)</td><td>- No disassembly, no fire within 7 days after the test</td><td>Only for
Single Cell Battery / Battery</td></tr>
<tr><td>Test 8. Forced Discharge</td><td>Discharge at max. discharge current
(connecting in series with 12V DC power supply),
Duration time = rated capacity/initial test current</td><td>- No disassembly, no fire within 7 days after the test</td><td>Resistance of Electric Loader
$Rt = \frac{12V + Vc}{Max\ discharge\ current}$
- Rc-Rw</td></tr>
</table>

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	13.162	200.30	13.161	200.30	99.99	0.000	Pass	12.961	200.30	98.48	0.000	Pass	12.958	200.30	99.98	0.000	Pass	12.958	200.30	100.00	0.000	Pass
2	13.162	200.35	13.161	200.35	99.99	0.000	Pass	12.961	200.35	98.48	0.000	Pass	12.958	200.35	99.98	0.000	Pass	12.958	200.35	100.00	0.000	Pass
3	13.185	200.61	13.185	200.61	100.00	0.000	Pass	12.444	200.61	94.38	0.000	Pass	12.442	200.61	99.98	0.000	Pass	12.442	200.61	100.00	0.000	Pass
4	13.178	200.45	13.178	200.45	100.00	0.000	Pass	12.974	200.45	98.45	0.000	Pass	12.972	200.45	99.98	0.000	Pass	12.972	200.45	100.00	0.000	Pass
B. 25th cycle fully charged state																						
5	13.228	200.43	13.228	200.43	100.00	0.000	Pass	12.953	200.43	97.92	0.000	Pass	12.951	200.43	99.98	0.000	Pass	12.951	200.43	100.00	0.000	Pass
6	13.228	200.42	13.227	200.42	99.99	0.000	Pass	12.952	200.42	97.92	0.000	Pass	12.950	200.42	99.98	0.000	Pass	12.950	200.42	100.00	0.000	Pass
7	13.227	200.40	13.227	200.40	100.00	0.000	Pass	12.644	200.40	95.59	0.000	Pass	12.643	200.40	99.99	0.000	Pass	12.643	200.40	100.00	0.000	Pass
8	13.222	200.58	13.222	200.58	100.00	0.000	Pass	12.966	200.58	98.06	0.000	Pass	12.965	200.58	99.99	0.000	Pass	12.965	200.58	100.00	0.000	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	12.958	56.95	Pass
2	12.958	56.76	Pass
3	12.442	56.60	Pass
4	12.972	56.32	Pass
B. 25th cycle fully charged state			
5	12.951	56.07	Pass
6	12.950	56.13	Pass
7	12.643	55.81	Pass
8	12.965	55.46	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
9	13.126	21.50	Pass
10	13.129	22.10	Pass
11	13.127	21.50	Pass
12	13.122	21.60	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 25th cycle fully charged state			
13	13.220	21.54	Pass
14	13.230	21.54	Pass
15	13.270	21.29	Pass
16	13.217	21.60	Pass

2-3. T6/T8 Test Result (P467970A1)

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state			
C-1	3.878	21.98	Pass
C-2	3.878	21.71	Pass
C-3	3.876	22.34	Pass
C-4	3.876	22.34	Pass
C-5	3.878	22.19	Pass
B. 25st cycle 50% charged state			
C-6	3.882	22.12	Pass
C-7	3.880	21.99	Pass
C-8	3.881	22.13	Pass
C-9	3.880	22.29	Pass
C-10	3.881	22.17	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. 25th cycle fully discharged state**			
C-6	3.470	65.73	Pass	C-16	3.385	71.16	Pass
C-7	3.466	65.74	Pass	C-17	3.404	68.60	Pass
C-8	3.459	69.46	Pass	C-18	3.420	72.88	Pass
C-9	3.457	67.21	Pass	C-19	3.406	73.10	Pass
C-10	3.455	65.56	Pass	C-20	3.430	68.89	Pass
C-11	3.474	68.52	Pass	C-21	3.413	68.14	Pass
C-12	3.474	66.42	Pass	C-22	3.412	68.13	Pass
C-13	3.463	65.35	Pass	C-23	3.400	63.69	Pass
C-14	3.474	65.59	Pass	C-24	3.410	65.76	Pass
C-15	3.468	66.26	Pass	C-25	3.419	74.78	Pass

3. Sample Image

Document Number	QDI-200730-B-L20L3P71-D1	
Prepared	Jie Ma	
Approved	Ying Li	

1.2m Drop Test Report
- L20L3P71 (Nom. 52.80Wh, 11.61V) -

2020. 07. 30

LG Chem

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(18th) special provisions 188	**1.2m Box Drop** - 1st drop : corner - 2nd drop : flat on the bottom - 3rd drop : flat on the top - 4th drop : flat on the long side - 5th drop : flat on the short side 	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	385*290*180mm	**Battery Quantity**	34 pcs/Box
Gross weight	8.860 kg	**Net Weight of Batteries**	6.817 kg

C. Image

Image-1	Image-2
	

D. Test Result

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