



**LG Chem, Ltd.**

128, Yeoui-daero, Yeongdeungpo-gu,  
Seoul, Korea

Certification & Evaluation Team  
Tel: 82-42-870-6195, Fax: 82-42-863-0182  
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## CERTIFICATE OF COMPLIANCE

The following product has been evaluated according to the 5<sup>th</sup> revised edition Amendment2 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 and batteries and single cell batteries.




<input type="checkbox"/> Lithium-ion cell <input checked="" type="checkbox"/> Lithium-ion battery <input type="checkbox"/> Lithium-ion single cell battery	
Model name	<b>L15L3PB0</b>
Cell Model name	<b>ICP595490A1</b>
Nominal voltage	<b>11.4 V</b>
Electric power capacity	<b>52.5 Wh</b>
Lithium equivalent content	<b>3.97g</b>

Conducted By: Dae Ho Nam

Manager  
Certification & Evaluation  
LG Chem. Ltd  
E-mail: [kkammy@lgchem.com](mailto:kkammy@lgchem.com)

Reviewed By: Byung Soo Kim

General Manager  
Certification & Evaluation  
LG Chem. Ltd  
E-mail: [bskim@lgchem.com](mailto:bskim@lgchem.com)

문서번호	QAE-EF02-160923-B-L15L3PB0	
Prepared	남익현	
	장승현	
Reviewed	남대호	
	박광민	
Approved	김병수	

# UN38.3 Test Report

## - L15L3PB0 (Nom.52.5Wh, 11.4V)-

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# 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℃	<ul style="list-style-type: none"> <li>- After OCV (%) ≥ 90%</li> <li>- No leakage, no venting, no disassembly, no rupture, no fire</li> <li>- Mass loss limit (leakage)                             <ol style="list-style-type: none"> <li>1) If M&lt;1g, less than 0.5%,</li> <li>2) If 1g≤M≤75g, less than 0.2%,</li> <li>3) If M&gt;75g, less than 0.1%)</li> </ol> </li> </ul>	<p>T1~T5 : Sequence Tests</p> <pre> graph TD     T1[Test 1 Altitude Simulation] --&gt; T2[Test 2 Thermal Test]     T2 --&gt; T3[Test 3 Vibration]     T3 --&gt; T4[Test 4 Shock]     T4 --&gt; 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 (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℃	<ul style="list-style-type: none"> <li>- No disassembly, no rupture, no fire within 6 hours after the test</li> <li>- Max. Temp ≤ 170℃</li> </ul>	
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	<ul style="list-style-type: none"> <li>- No disassembly, no fire within 6 hours after the test</li> <li>- Max. Temp ≤ 170℃</li> </ul>	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"> <li>- No disassembly, no fire within 7 days after the test</li> </ul>	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"> <li>- No disassembly, no fire within 7 days after the test</li> </ul>	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	13.012	219.13	13.009	219.12	99.98	0.005	Pass	12.861	219.12	98.86	0.000	Pass	12.858	219.10	99.98	0.009	Pass	12.854	219.09	99.97	0.005	Pass
2	13.010	219.33	13.005	219.32	99.96	0.005	Pass	12.833	219.29	98.68	0.014	Pass	12.833	219.27	100.00	0.009	Pass	12.828	219.27	99.96	0.000	Pass
3	13.016	219.16	13.012	219.15	99.97	0.005	Pass	12.844	219.12	98.71	0.014	Pass	12.844	219.11	100.00	0.005	Pass	12.838	219.11	99.95	0.000	Pass
4	13.016	219.65	13.016	219.64	100.00	0.005	Pass	12.847	219.62	98.70	0.009	Pass	12.844	219.61	99.98	0.005	Pass	12.840	219.61	99.97	0.000	Pass

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

5	13.038	219.32	13.034	219.32	99.97	0.000	Pass	12.872	219.30	98.76	0.009	Pass	12.871	219.28	99.99	0.009	Pass	12.868	219.27	99.98	0.005	Pass
6	13.007	219.87	13.004	219.86	99.98	0.005	Pass	12.839	219.86	98.73	0.000	Pass	12.834	219.85	99.96	0.005	Pass	12.831	219.85	99.98	0.000	Pass
7	13.001	219.30	12.997	219.29	99.97	0.005	Pass	12.838	219.28	98.78	0.005	Pass	12.834	219.26	99.97	0.009	Pass	12.829	219.25	99.96	0.005	Pass
8	12.998	219.43	12.998	219.42	100.00	0.005	Pass	12.843	219.42	98.81	0.000	Pass	12.839	219.42	99.97	0.000	Pass	12.838	219.42	99.99	0.000	Pass

# 2-2. T5/T7 Test Result

EXT.Short Circuit (T5)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

**A. 1st cycle fully charged state**

1	12.854	55.69	Pass
2	12.828	56.02	Pass
3	12.838	55.22	Pass
4	12.840	55.89	Pass

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

5	12.868	55.31	Pass
6	12.831	54.78	Pass
7	12.829	54.59	Pass
8	12.838	54.54	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

**A. 1st cycle fully charged state**

9	12.991	24.27	Pass
10	12.992	24.95	Pass
11	12.991	25.97	Pass
12	12.996	25.92	Pass

Over Charge (T7)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

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

13	12.973	26.12	Pass
14	12.971	24.38	Pass
15	12.976	25.93	Pass
16	12.974	24.58	Pass

# 2-3. T6/T8 Test Result (ICP595490A1)

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

**A. 1st cycle 50% charged state**

C-1	3.733	24.25	Pass
C-2	3.723	23.95	Pass
C-3	3.724	23.69	Pass
C-4	3.733	23.45	Pass
C-5	3.727	23.47	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	3.396	80.41	Pass
C-7	3.395	81.99	Pass
C-8	3.399	86.40	Pass
C-9	3.401	79.60	Pass
C-10	3.397	90.31	Pass
C-11	3.980	81.89	Pass
C-12	3.399	84.08	Pass
C-13	3.398	81.53	Pass
C-14	3.398	82.76	Pass
C-15	3.400	73.80	Pass

**B. 50th cycle fully discharged state**

C-16	3.780	88.63	Pass
C-17	3.588	78.32	Pass
C-18	3.542	99.41	Pass
C-19	3.591	76.73	Pass
C-20	3.605	88.63	Pass
C-21	3.616	81.87	Pass
C-22	3.572	86.43	Pass
C-23	3.581	88.18	Pass
C-24	3.612	88.15	Pass
C-25	3.578	85.56	Pass

# 3. Sample Image

