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CERTIFICATE OF COMPLIANCE

The following product has been evaluated according to the 5th 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.

☐ Lithium-ion cell ☑ Lithium-ion battery ☐ Lithium-ion single cell battery	
Model name	**L17L3P51**
Cell Model name	**ICP595490L1**
Nominal voltage	**11.1 V**
Electric power capacity	**45 Wh**

Conducted By: Min Je Woo

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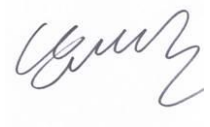

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UN38.3 Test Report
- L17L3P51 (Nom.45Wh, 11.1V)-

Index

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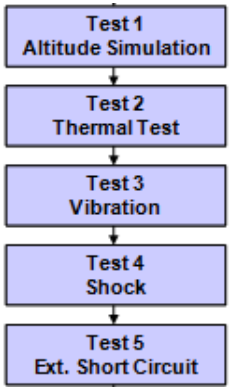
1. UN38.3 Test Condition

Test item	Test Condition	Requirements	Etc.
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- 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%	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 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℃	- No disassembly, no rupture, no fire within 6 hours after the test - Max. Temp ≤ 170℃	
Test 6. Impact	Φ=15.8±0.1mm bar, 9.1±0.1kg mass, 61±2.5cm height	- 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)	- 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. General Information

1. Standard charge / discharge Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 3945 mA Voltage = 12.6 V	Current = 198 mA
Discharge	CC	Current = 789 mA	Voltage = 9.0 V

2. Cycle Condition

	Mode	Condition	End Condition
Charge	CC / CV	Current = 3945 mA Voltage = 12.6 V	Current = 198 mA
Discharge	CC	Current = 789 mA	Voltage = 9.0 V

3. Test Condition

	Mode	Condition
Test 7. Overcharge	CC / CV	Max. Charge Current = 3945 mA CC/CV 2Imax (7890mA) 22 V cut-off 24Hr
Test 8. Forced Discharge	CC	Max. Discharge Current = 3945 mA Duration Time = 60.5 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	12.571	215.40	12.559	215.38	99.90	0.009	Pass	12.413	215.38	98.84	0.000	Pass	12.314	215.37	99.20	0.005	Pass	12.283	215.36	99.75	0.005	Pass
2	12.543	215.55	12.522	215.54	99.83	0.005	Pass	12.385	215.53	98.91	0.005	Pass	12.295	215.51	99.27	0.009	Pass	12.234	215.50	99.50	0.005	Pass
3	12.541	215.37	12.521	215.36	99.84	0.005	Pass	12.391	215.36	98.96	0.000	Pass	12.283	215.35	99.13	0.005	Pass	12.242	215.34	99.67	0.005	Pass
4	12.540	215.30	12.519	215.30	99.83	0.000	Pass	12.401	215.28	99.06	0.009	Pass	12.285	215.28	99.06	0.000	Pass	12.241	215.27	99.64	0.005	Pass
B. 50th cycle fully charged state																						
5	12.562	215.42	12.546	215.40	99.87	0.009	Pass	12.418	215.40	98.98	0.000	Pass	12.296	215.39	99.02	0.005	Pass	12.272	215.37	99.80	0.009	Pass
6	12.561	215.55	12.545	215.53	99.87	0.009	Pass	12.409	215.53	98.92	0.000	Pass	12.288	215.52	99.02	0.005	Pass	12.251	215.52	99.70	0.000	Pass
7	12.566	215.62	12.551	215.61	99.88	0.005	Pass	12.413	215.61	98.90	0.000	Pass	12.293	215.61	99.03	0.000	Pass	12.266	215.60	99.78	0.005	Pass
8	12.569	215.52	12.554	215.52	99.88	0.000	Pass	12.415	215.51	98.89	0.005	Pass	12.298	215.50	99.06	0.005	Pass	12.269	215.49	99.76	0.005	Pass

3-2. T5/T7 Test Result

EXT.Short Circuit (T5)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
1	12.283	55.51	Pass
2	12.234	55.82	Pass
3	12.242	55.41	Pass
4	12.241	54.74	Pass
B. 50th cycle fully charged state			
5	12.272	55.83	Pass
6	12.251	55.81	Pass
7	12.266	55.42	Pass
8	12.269	55.18	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
9	12.543	24.77	Pass
10	12.544	24.65	Pass
11	12.545	23.56	Pass
12	12.541	23.78	Pass

Over Charge (T7)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully charged state			
13	12.522	23.74	Pass
14	12.523	23.87	Pass
15	12.521	24.03	Pass
16	12.525	23.69	Pass

3-3. T6/T8 Test Result (ICP595490L1)

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (℃)	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 (℃)	Result	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully discharged state				**B. 50th cycle fully discharged state**			
C-6	3.396	80.41	**Pass**	**C-16**	3.780	88.63	**Pass**
C-7	3.395	81.99	**Pass**	**C-17**	3.588	78.32	**Pass**
C-8	3.399	86.40	**Pass**	**C-18**	3.542	99.41	**Pass**
C-9	3.401	79.60	**Pass**	**C-19**	3.591	76.73	**Pass**
C-10	3.397	90.31	**Pass**	**C-20**	3.605	88.63	**Pass**
C-11	3.980	81.89	**Pass**	**C-21**	3.616	81.87	**Pass**
C-12	3.399	84.08	**Pass**	**C-22**	3.572	86.43	**Pass**
C-13	3.398	81.53	**Pass**	**C-23**	3.581	88.18	**Pass**
C-14	3.398	82.76	**Pass**	**C-24**	3.612	88.15	**Pass**
C-15	3.400	73.80	**Pass**	**C-25**	3.578	85.56	**Pass**

4. Sample Image