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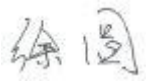
CERTIFICATE OF COMPLIANCE

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.

☐ Lithium-ion cell ☑ Lithium-ion battery ☐ Lithium-ion single cell battery	
Model name	**L18L4PF0**
Cell Model name	**P595490B4**
Nominal voltage	**15.12V**
Electric power capacity	**70.00Wh**

Approved By: Xuyuan



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UN38.3 Test Report
- L18L4PF0 (Nom. 70.00Wh, 15.12V) -

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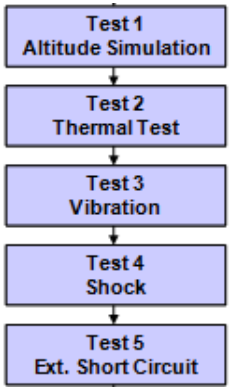
1. UN38.3 Test Condition

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 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℃	- 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)

2-1. T1-T4 Test Result

Before			Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
NO.	OCV	Mass	OCV	Mass	After OCV(%)	Mass Loss(%)	Result	OCV	Mass	After OCV(%)	Mass Loss(%)	Result	OCV	Mass	After OCV(%)	Mass Loss(%)	Result	OCV	Mass	After OCV(%)	Mass Loss(%)	Result
A. 1st cycle fully charged state																						
1	16.8083	288.16	16.8028	288.15	99.97	0.003	**Pass**	16.4939	288.04	98.16	0.038	**Pass**	16.4853	288.07	99.95	0.000	**Pass**	16.4826	288.08	99.98	0.000	**Pass**
2	16.7909	286.55	16.7852	286.55	99.97	0.000	**Pass**	16.8948	286.44	100.00	0.038	**Pass**	16.8885	286.46	99.96	0.000	**Pass**	16.8837	286.47	99.97	0.000	**Pass**
3	16.8083	288.24	16.8038	288.25	99.97	0.000	**Pass**	16.4968	288.12	98.17	0.045	**Pass**	16.4861	288.15	99.94	0.000	**Pass**	16.4842	288.16	99.99	0.000	**Pass**
4	16.8019	287.47	16.7958	287.46	99.96	0.003	**Pass**	16.4896	287.35	98.18	0.038	**Pass**	16.4775	287.38	99.93	0.000	**Pass**	16.4765	287.38	99.99	0.000	**Pass**
B. 50th cycle fully charged state																						
5	16.8221	288.65	16.8188	288.65	99.98	0.000	**Pass**	16.5283	288.54	98.27	0.038	**Pass**	16.5179	288.58	99.94	0.000	**Pass**	16.5159	288.58	99.99	0.000	**Pass**
6	16.8169	288.21	16.8142	288.21	99.98	0.000	**Pass**	16.5248	288.12	98.28	0.031	**Pass**	16.5143	288.14	99.94	0.000	**Pass**	16.5127	288.16	99.99	0.000	**Pass**
7	16.8123	286.42	16.8093	286.43	99.98	0.000	**Pass**	16.5196	286.33	98.28	0.035	**Pass**	16.5096	286.36	99.94	0.000	**Pass**	16.5076	286.37	99.99	0.000	**Pass**
8	16.8257	288.51	16.8238	288.53	99.99	0.000	**Pass**	16.5330	288.43	98.27	0.035	**Pass**	16.5245	288.47	99.95	0.000	**Pass**	16.5235	288.46	99.99	0.003	**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	16.4826	58.35	**Pass**
2	16.8837	58.15	**Pass**
3	16.4842	57.60	**Pass**
4	16.4765	57.30	**Pass**
B. 50th cycle fully charged state			
5	16.5159	58.44	**Pass**
6	16.5127	58.16	**Pass**
7	16.5076	57.95	**Pass**
8	16.5235	57.23	**Pass**

Overcharge (T7)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
9	12.5005	24.01	**Pass**
10	12.5053	24.01	**Pass**
11	12.5114	23.91	**Pass**
12	12.5145	23.75	**Pass**
B. 50th cycle fully charged state			
13	12.5234	23.91	**Pass**
14	12.5205	23.51	**Pass**
15	12.5178	23.57	**Pass**
16	12.5238	23.41	**Pass**

2-3. T6/T8 Test Result (P595490B4)

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state			
C-1	3.827	20.73	**Pass**
C-2	3.826	20.37	**Pass**
C-3	3.826	19.75	**Pass**
C-4	3.826	20.11	**Pass**
C-5	3.252	20.30	**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	3.243	82.06	**Pass**	**C-16**	3.325	77.94	**Pass**
C-7	3.240	73.57	**Pass**	**C-17**	3.323	80.22	**Pass**
C-8	3.239	72.69	**Pass**	**C-18**	3.334	88.16	**Pass**
C-9	3.241	79.03	**Pass**	**C-19**	3.334	80.73	**Pass**
C-10	3.241	74.51	**Pass**	**C-20**	3.325	76.07	**Pass**
C-11	3.244	78.94	**Pass**	**C-21**	3.330	80.85	**Pass**
C-12	3.251	76.06	**Pass**	**C-22**	3.332	78.83	**Pass**
C-13	3.243	77.02	**Pass**	**C-23**	3.334	75.14	**Pass**
C-14	3.243	77.20	**Pass**	**C-24**	3.330	82.70	**Pass**
C-15	3.242	68.57	**Pass**	**C-25**	3.342	78.34	**Pass**

3. Sample Image