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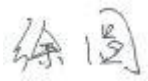
CERTIFICATE OF COMPLIANCE

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	**L18L3P71**
Cell Model name	**ICP478873L1**
Nominal voltage	**11.58V**
Electric power capacity	**57.00Wh**

Approved By: Xuyuan



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UN38.3 Test Report
- L18L3P71 (Nom. 57.00Wh, 11.58V) -

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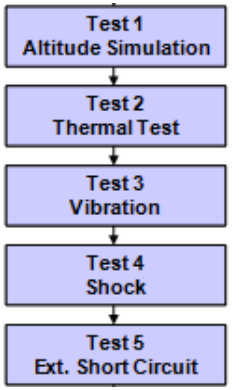
1. UN38.3 Test Condition

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	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 cycle fully charged state																						
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**
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**

Overcharge (T7)			
NO.	Initial OCV(V)	Max. Temp (℃)	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			
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)

Crush (T6)

A. 1st cycle 50% charged state

NO.	Initial OCV(V)	Max. Temp (℃)	Result
C-1	3.864	22.06	Pass
C-2	3.861	22.98	Pass
C-3	3.860	22.79	Pass
C-4	3.864	22.06	Pass
C-5	3.863	22.34	Pass

Forced Discharge (T8)

A. 1st cycle fully discharged state / B. 50th cycle fully discharged state

NO.	Initial OCV(V)	Max. Temp (℃)	Result	NO.	Initial OCV(V)	Max. Temp (℃)	Result
C-6	3.017	41.15	Pass	C-16	3.080	41.19	Pass
C-7	3.027	42.45	Pass	C-17	3.077	40.98	Pass
C-8	3.045	44.61	Pass	C-18	3.057	44.85	Pass
C-9	3.050	44.41	Pass	C-19	3.062	43.64	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