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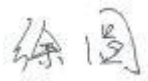
CERTIFICATE OF COMPLIANCE

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	**L18L3P73**
Cell Model name	**P468073A1**
Nominal voltage	**11.55V**
Electric power capacity	**51.00Wh**

Approved By: Xuyuan



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Document Number	QDI-180820-B-L18L3P73	
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UN38.3 Test Report
- L18L3P73 (Nom. 51.00Wh, 11.55V) -

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2018. 08. 20

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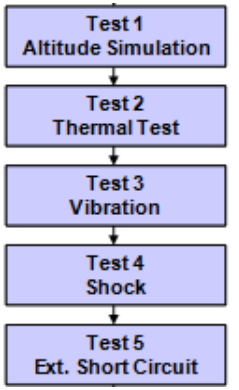
1. UN38.3 Test Condition

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	12.6101	202.22	12.6083	202.18	99.99	0.020	**Pass**	12.3741	202.20	98.14	0.000	**Pass**	12.3658	202.24	99.93	0.000	**Pass**	12.3688	202.24	100.00	0.000	**Pass**
2	12.5990	202.39	12.5990	202.36	100.00	0.015	**Pass**	12.3658	202.37	98.15	0.000	**Pass**	12.3623	202.41	99.97	0.000	**Pass**	12.3604	202.42	99.98	0.000	**Pass**
3	12.6065	201.71	12.6091	201.67	100.00	0.020	**Pass**	12.3713	201.70	98.11	0.000	**Pass**	12.3671	201.74	99.97	0.000	**Pass**	12.3663	201.74	99.99	0.000	**Pass**
4	12.6005	202.28	12.6031	202.24	100.00	0.020	**Pass**	12.3676	202.28	98.13	0.000	**Pass**	12.3652	202.30	99.98	0.000	**Pass**	12.3634	202.30	99.99	0.000	**Pass**
B. 50th cycle fully charged state																						
5	13.0451	201.87	13.0378	201.82	99.94	0.025	**Pass**	12.8138	201.84	98.28	0.000	**Pass**	12.8123	201.89	99.99	0.000	**Pass**	12.8015	201.90	99.92	0.000	**Pass**
6	13.0496	202.80	13.0432	202.76	99.95	0.020	**Pass**	12.8154	202.80	98.25	0.000	**Pass**	12.8143	202.83	99.99	0.000	**Pass**	12.8116	202.83	99.98	0.000	**Pass**
7	12.6352	202.96	12.6375	202.92	100.00	0.020	**Pass**	12.4095	202.95	98.20	0.000	**Pass**	12.4056	202.98	99.97	0.000	**Pass**	12.4034	202.99	99.98	0.000	**Pass**
8	13.0296	202.47	13.0236	202.44	99.95	0.015	**Pass**	12.8032	202.48	98.31	0.000	**Pass**	12.8020	202.50	99.99	0.000	**Pass**	12.8002	202.51	99.99	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	12.3688	58.16	**Pass**
2	12.3604	58.14	**Pass**
3	12.3663	57.42	**Pass**
4	12.3634	57.20	**Pass**
B. 50th cycle fully charged state			
5	12.4042	58.40	**Pass**
6	12.8116	58.36	**Pass**
7	12.4034	57.89	**Pass**
8	12.8002	57.57	**Pass**

Overcharge (T7)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully charged state			
9	12.3128	21.80	**Pass**
10	12.6023	21.50	**Pass**
11	12.2304	21.70	**Pass**
12	12.6038	21.34	**Pass**
B. 50th cycle fully charged state			
13	13.0469	21.50	**Pass**
14	13.0386	21.19	**Pass**
15	12.6267	21.35	**Pass**
16	12.6214	20.99	**Pass**

2-3. T6/T8 Test Result (P468073A1)

Crush (T6)

NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state			
C-1	3.8468	21.41	**Pass**
C-2	3.8458	24.91	**Pass**
C-3	3.8468	25.40	**Pass**
C-4	3.8452	25.91	**Pass**
C-5	3.8450	24.98	**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	3.4259	83.27	**Pass**	**C-16**	3.5843	90.56	**Pass**
C-7	3.4090	83.54	**Pass**	**C-17**	3.5940	94.15	**Pass**
C-8	3.4187	85.99	**Pass**	**C-18**	3.5750	99.04	**Pass**
C-9	3.4148	86.49	**Pass**	**C-19**	3.5455	88.28	**Pass**
C-10	3.4159	92.66	**Pass**	**C-20**	3.5470	95.54	**Pass**
C-11	3.4190	87.37	**Pass**	**C-21**	3.5915	98.42	**Pass**
C-12	3.4250	89.10	**Pass**	**C-22**	3.5775	96.77	**Pass**
C-13	3.4202	66.55	**Pass**	**C-23**	3.5735	87.43	**Pass**
C-14	3.4192	90.48	**Pass**	**C-24**	3.5443	93.34	**Pass**
C-15	3.4166	88.19	**Pass**	**C-25**	3.5612	85.76	**Pass**

3. Sample Image