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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.




<input type="checkbox"/> Lithium-ion cell <input checked="" type="checkbox"/> Lithium-ion battery <input type="checkbox"/> Lithium-ion single cell battery	
Model name	L14L2P22
Cell Model name	ICP595490A1
Nominal voltage	7.6 V
Electric power capacity	35 Wh
Lithium equivalent content	1.386 g

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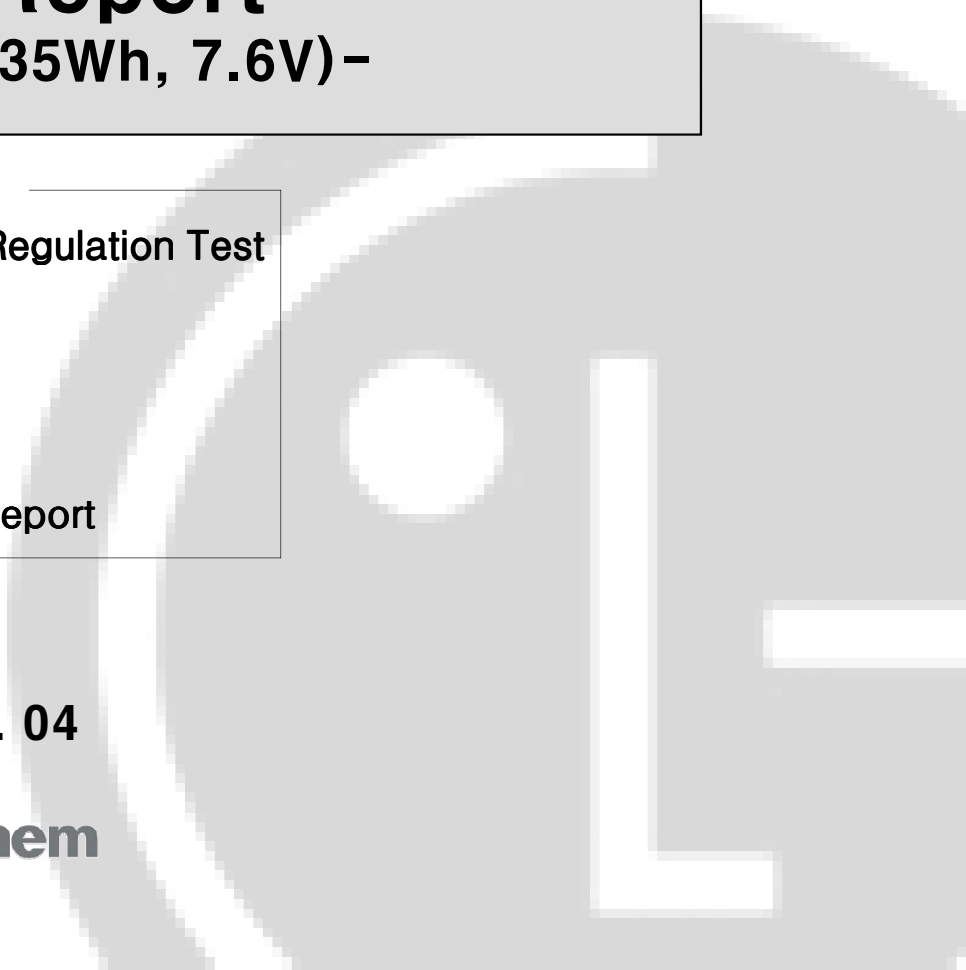
UN Test Report

- L14L2P22(Nom.35Wh, 7.6V) -

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2014. 12. 04



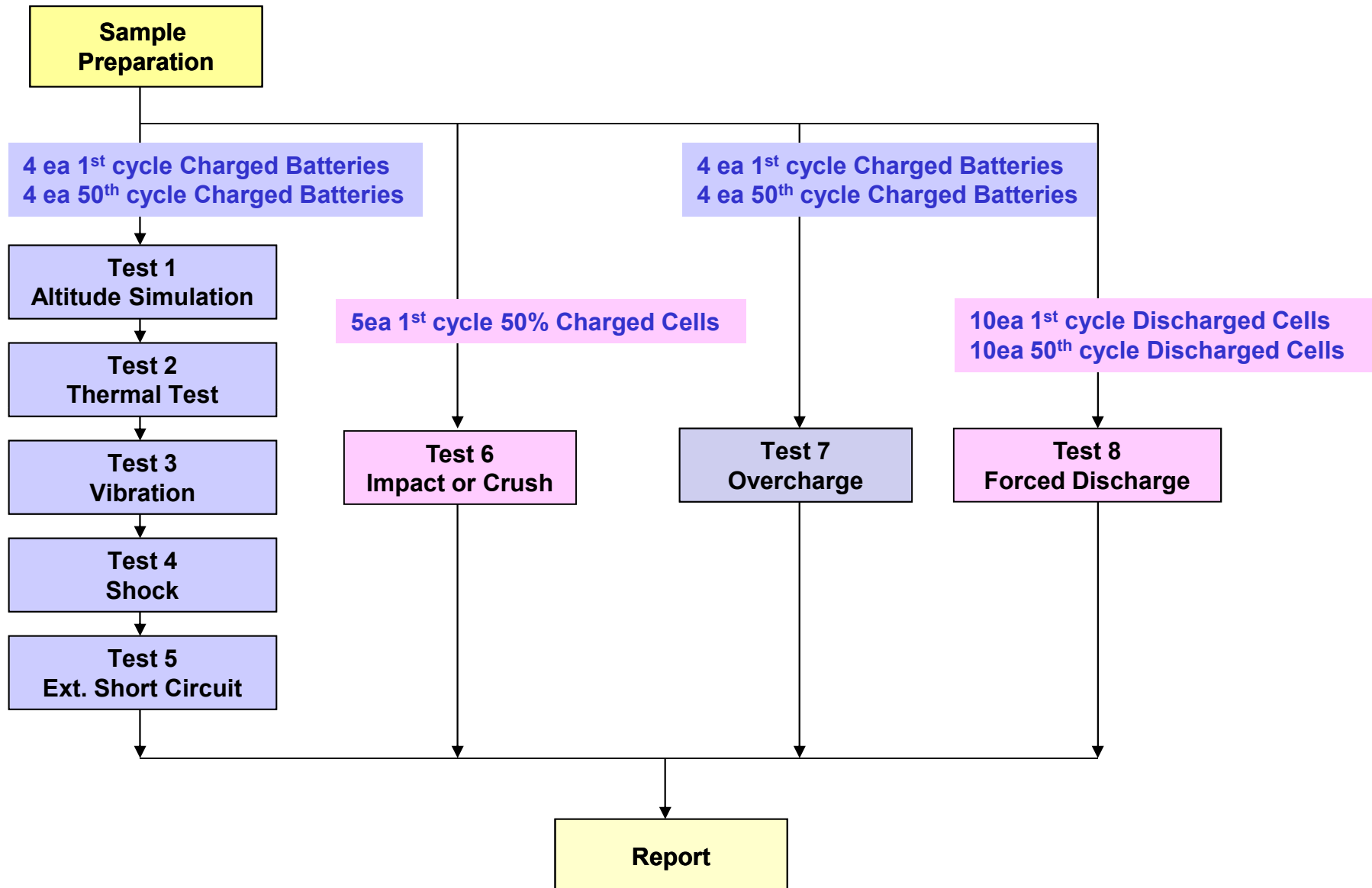
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- Measuring mass before/ after each test (If M<1g, less than 0.5%, If 1g≤M≤75g, less than 0.2%, If M>75g, less than 0.1%) - Measuring voltage before/ after each test (more than 90%) - No leakage, no venting, no disassembly, no rupture, no fire
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℃	
Test 6. Impact for cylindrical cells (> 18mm diameter)	Φ=15.8mm bar, 9.1kg mass, 61±2.5cm height	- No disassembly, no fire within 6 hours after the test - Temp. monitoring (max. 170℃)
Test 6. Crush for cylindrical cells (≤ 18mm diameter) for prismatic, pouch, coin/button cells	Crushing rate :1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation	
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 V (min.) = 22V. 2.If charge voltage > 18V, V (min.) = 1.2 x (max. charge voltage)	- No disassembly, no fire within 7 days after the test
Test 8. Forced Discharge	Discharge at max. discharge current (with 12V DC power supply), Duration time = rated capacity/initial test current	

* Tests through T1-T5 shall be conducted in sequence with the same samples.

* We declare that the above-mentioned test is the result of being checked according to UN Test (Manual of Test and Criteria ST/SG/AC.10/11/Rev.5/Amd.2)

2. Test Procedure



3-1. T1-T4 Test Result

Before				Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
	NO.	OCV	Mass	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result	OCV	Mass	Residual OCV(%)	Mass Loss(%)	Result

A. 1st cycle fully state

Charge	1	8.671	156.61	8.666	156.59	99.94	0.013	Pass	8.552	156.58	98.68	0.006	Pass	8.550	156.57	99.98	0.006	Pass	8.547	156.57	99.96	0.000	Pass
	2	8.641	156.69	8.633	156.67	99.91	0.013	Pass	8.528	156.67	98.78	0.000	Pass	8.527	156.67	99.99	0.000	Pass	8.524	156.67	99.96	0.000	Pass
	3	8.653	156.50	8.643	156.48	99.88	0.013	Pass	8.539	156.48	98.80	0.000	Pass	8.536	156.48	99.96	0.000	Pass	8.533	156.47	99.96	0.006	Pass
	4	8.653	156.37	8.634	156.37	99.78	0.000	Pass	8.523	156.36	98.71	0.006	Pass	8.521	156.36	99.98	0.000	Pass	8.518	156.36	99.96	0.000	Pass
	Ave.	8.655	156.54	8.644	156.53	99.88	0.010	-	8.536	156.52	98.74	0.003	-	8.534	156.52	99.98	0.002	-	8.531	156.52	99.96	0.002	-

B. 50th cycle fully state

Charge	5	8.664	156.70	8.654	156.70	99.88	0.000	Pass	8.553	156.70	98.83	0.000	Pass	8.550	156.69	99.96	0.006	Pass	8.547	156.68	99.96	0.006	Pass
	6	8.665	156.81	8.651	156.81	99.84	0.000	Pass	8.541	156.80	98.73	0.006	Pass	8.540	156.79	99.99	0.006	Pass	8.540	156.79	100.00	0.000	Pass
	7	8.666	156.78	8.656	156.77	99.88	0.006	Pass	8.545	156.76	98.72	0.006	Pass	8.542	156.76	99.96	0.000	Pass	8.538	156.75	99.95	0.006	Pass
	8	8.656	156.13	8.648	156.12	99.91	0.006	Pass	8.544	156.12	98.80	0.000	Pass	8.541	156.11	99.96	0.006	Pass	8.538	156.10	99.96	0.006	Pass
	Ave.	8.663	156.61	8.652	156.60	99.88	0.003	-	8.546	156.60	98.77	0.003	-	8.543	156.59	99.97	0.005	-	8.541	156.58	99.97	0.005	-

Requirement	<ul style="list-style-type: none"> - Measuring mass before/after each test (If $M > 75g$, less than 0.1%, $1g \leq M \leq 75$, less than 0.2%, $M < 1g$, less than 0.5%) - Measuring voltage before/after each test (more than 90%, only charged samples) - No leakage, no venting, no disassembly, no rupture, no fire
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3-2. T5/T7 Test Result

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

A. 1st cycle fully state

Charge	1	8.547	56.62	Pass
	2	8.524	55.41	Pass
	3	8.533	55.82	Pass
	4	8.518	54.99	Pass
	MAX.	8.547	56.62	-

Test Condition
- 100mΩ ext. short-circuit at 55± 2 °C

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

A. 1st cycle fully state

Charge	9	8.650	23.75	Pass
	10	8.649	23.68	Pass
	11	8.646	24.43	Pass
	12	8.648	23.56	Pass
	MAX.	8.650	24.43	-

Test Condition
- Max. Charge Current : 2305mA - CC/CV 2Imax(4610mA) 17.4V cut-off 24Hr

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

B. 50th cycle fully state

Charge	5	8.547	56.53	Pass
	6	8.540	56.40	Pass
	7	8.538	55.70	Pass
	8	8.538	55.82	Pass
	MAX.	8.547	56.53	-

Requirement
- Temperature ≤ 170 (°C) - No disassembly, no rupture, no fire within 6 hours after the test

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

B. 50th cycle fully state

Charge	13	8.624	24.91	Pass
	14	8.621	23.31	Pass
	15	8.629	24.84	Pass
	16	8.621	25.09	Pass
	MAX.	8.629	25.09	-

Requirement
- No disassembly, no fire within 7 day after the test

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

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

A. 1st cycle 50% charged state (Direction :Flat)

Flat	C-1	3.816	22.57	Pass
	C-2	3.817	22.44	Pass
	C-3	3.816	22.42	Pass
	C-4	3.817	22.47	Pass
	C-5	3.816	22.48	Pass
MAX.		3.817	22.57	-

Test Condition
- Crushing rate :1.5cm/s, until 13kN±0.78kN or 100mV drop or 50% deformation

Requirement
- Temperature ≤ 170 (°C)
- No disassembly, no fire within 6 hours after the test

Forced Discharge (T8)			
NO.	Initial OCV(V)	Max. Temp (°C)	Result

A. 1st cycle fully Discharged state

C-6	3.112	46.32	Pass
C-7	3.110	45.74	Pass
C-8	3.109	44.21	Pass
C-9	3.115	47.13	Pass
C-10	3.109	48.21	Pass
C-11	3.116	47.56	Pass
C-12	3.108	47.46	Pass
C-13	3.114	47.20	Pass
C-14	3.110	48.49	Pass
C-15	3.114	47.32	Pass
MAX.	3.116	48.49	-

B. 50th cycle fully discharged state

C-16	3.221	44.84	Pass
C-17	3.222	44.26	Pass
C-18	3.218	43.21	Pass
C-19	3.220	44.56	Pass
C-20	3.217	45.26	Pass
C-21	3.225	45.52	Pass
C-22	3.219	46.79	Pass
C-23	3.220	44.52	Pass
C-24	3.222	44.82	Pass
C-25	3.216	42.69	Pass
MAX.	3.225	46.82	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 4500mA Duration time: rated capacity (60.0min)

Requirement
- No disassembly, no fire within 7 days after the test

4. Sample Image

