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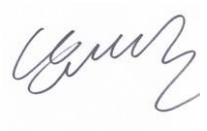
CERTIFICATE OF COMPLIANCE

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	**L14L2P21**
Cell Model name	**ICP595490L1**
Nominal voltage	**7.4 V**
Electric power capacity	**30 Wh**
Lithium Content	**1.215g**

Conducted By: Dae Ho Nam



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UN Test Report
- L14L2P21(Nom.30Wh, 7.4V)-

목 차

2014. 08. 26

LG Chem

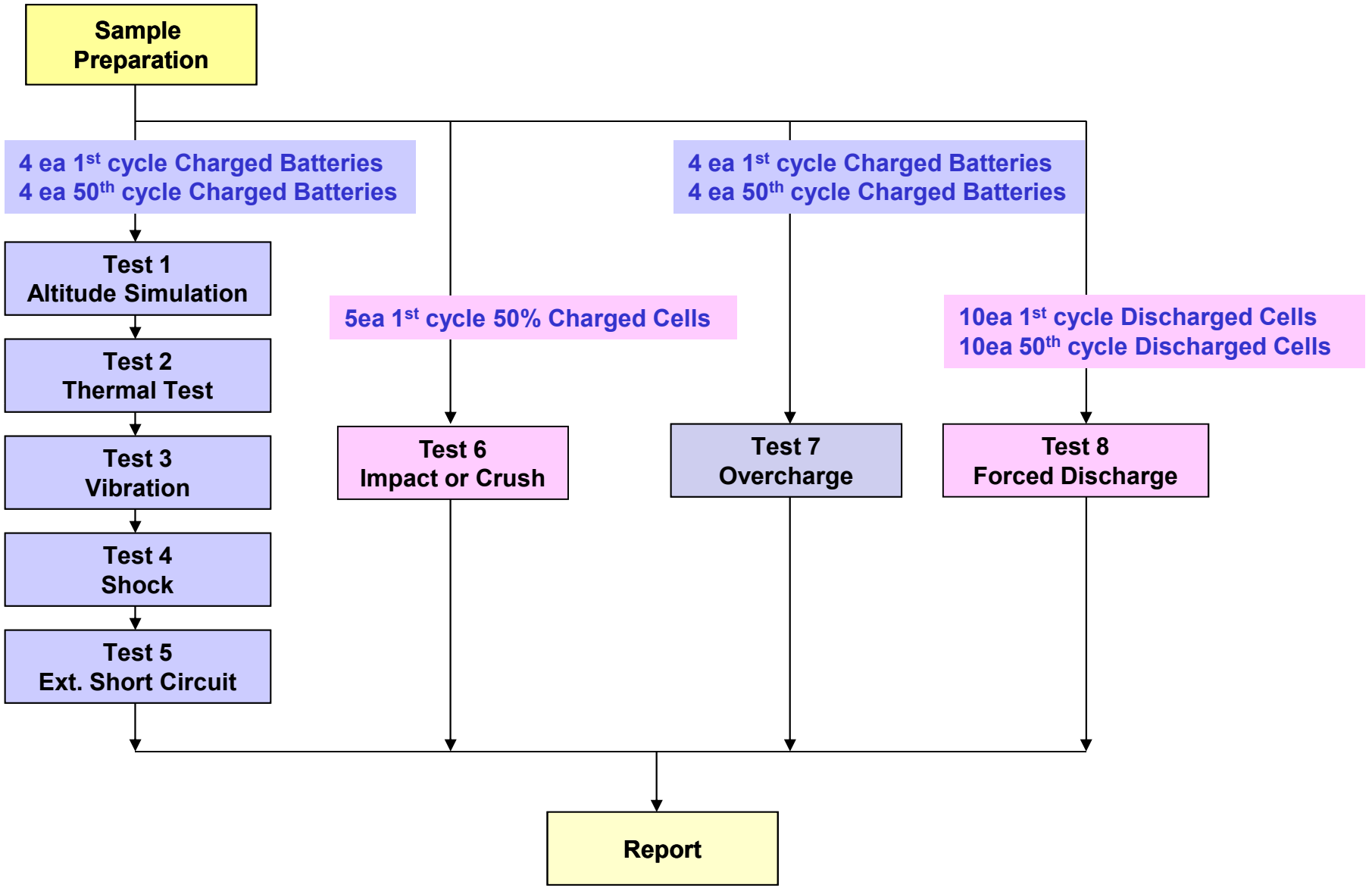
1. UN Transportation Regulation Test

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℃	- No disassembly, no rupture, no fire within 6 hours after the test - Temp. monitoring (max. 170℃)
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	8.381	160.190	8.370	160.180	99.87	0.007	Pass	8.261	160.162	98.70	0.011	Pass	8.258	160.160	99.96	0.001	Pass	8.258	160.155	100.00	0.003	Pass
	2	8.340	160.778	8.326	160.761	99.84	0.011	Pass	8.216	160.759	98.67	0.001	Pass	8.216	160.757	100.00	0.001	Pass	8.214	160.751	99.98	0.004	Pass
	3	8.350	160.346	8.336	160.329	99.83	0.010	Pass	8.229	160.327	98.72	0.001	Pass	8.227	160.325	99.98	0.001	Pass	8.225	160.314	99.98	0.007	Pass
	4	8.341	160.274	8.327	160.261	99.83	0.008	Pass	8.224	160.257	98.76	0.003	Pass	8.222	160.257	99.98	0.000	Pass	8.220	160.244	99.98	0.008	Pass
	Ave.	8.353	160.397	8.340	160.383	99.84	0.009	-	8.233	160.376	98.71	0.004	-	8.231	160.375	99.98	0.001	-	8.229	160.366	99.98	0.005	-
B. 50th cycle fully state																							
Charge	5	8.368	160.428	8.359	160.418	99.89	0.006	Pass	8.247	160.398	98.66	0.012	Pass	8.247	160.395	100.00	0.002	Pass	8.245	160.382	99.98	0.008	Pass
	6	8.353	160.884	8.338	160.875	99.82	0.006	Pass	8.225	160.864	98.65	0.007	Pass	8.224	160.856	99.99	0.005	Pass	8.223	160.851	99.99	0.003	Pass
	7	8.358	160.389	8.347	160.376	99.87	0.008	Pass	8.247	160.364	98.80	0.008	Pass	8.244	160.351	99.96	0.008	Pass	8.242	160.341	99.98	0.006	Pass
	8	8.368	160.588	8.356	160.569	99.86	0.012	Pass	8.251	160.555	98.74	0.009	Pass	8.250	160.552	99.99	0.002	Pass	8.249	160.546	99.99	0.004	Pass
	Ave.	8.362	160.572	8.350	160.560	99.86	0.008	-	8.243	160.545	98.71	0.009	-	8.241	160.539	99.98	0.004	-	8.240	160.530	99.98	0.005	-

Requirement	- Measuring mass before/after each test (If M>75g, less than 0.1%, 1g≤M≤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

3-2. T5/T7 Test Result

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	1	8.258	55.38	Pass
	2	8.214	55.05	Pass
	3	8.225	56.53	Pass
	4	8.220	55.05	Pass
	MAX.	8.258	56.53	-

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	5	8.245	55.18	Pass
	6	8.223	56.13	Pass
	7	8.242	54.80	Pass
	8	8.249	55.30	Pass
	MAX.	8.249	56.13	-

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

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

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	9	8.349	23.38	Pass
	10	8.344	25.25	Pass
	11	8.347	24.62	Pass
	12	8.348	23.52	Pass
	MAX.	8.349	25.25	-

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	13	8.328	24.58	Pass
	14	8.326	24.23	Pass
	15	8.321	24.79	Pass
	16	8.327	23.76	Pass
	MAX.	8.328	24.79	-

Test Condition
- Max. Charge Current : 2100mA - CC/CV 2Imax(4200mA) 16.8V cut-off 24Hr

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

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

Crush (T6)				
Direction	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state (Direction :Flat)				
Flat	C-1	3.772	22.67	Pass
	C-2	3.771	22.71	Pass
	C-3	3.776	23.15	Pass
	C-4	3.774	23.26	Pass
	C-5	3.771	23.35	Pass
MAX.		3.776	23.71	-

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

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

Forced Discharge (T8)			
NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully Discharged state			
C-6	3.012	46.32	Pass
C-7	3.010	45.74	Pass
C-8	3.009	44.21	Pass
C-9	3.015	47.13	Pass
C-10	3.009	48.21	Pass
C-11	3.014	47.56	Pass
C-12	3.008	47.46	Pass
C-13	3.014	47.20	Pass
C-14	3.010	46.49	Pass
C-15	3.014	47.32	Pass
MAX.	3.015	48.21	-
B. 50th cycle fully discharged state			
C-16	3.121	44.84	Pass
C-17	3.122	44.26	Pass
C-18	3.118	43.21	Pass
C-19	3.120	44.56	Pass
C-20	3.117	45.26	Pass
C-21	3.123	45.52	Pass
C-22	3.119	46.79	Pass
C-23	3.120	44.52	Pass
C-24	3.122	44.62	Pass
C-25	3.116	42.69	Pass
MAX.	3.123	46.79	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 3980mA Duration time: rated capacity (60.5min)

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

4. Sample Image

Appendix 1. 1.2m Drop Test Report

A. Test Result

No	Name of Test Items	Standard requirement or The Clause Number of Standard	Test Result		Conclusion
1	1.2m Drop Test	* UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(18th) special provisions 188	Face	The package is not cracked, the contents are not damaged and not shifted.	Passed
			Edge	The package is not cracked, the contents are not damaged and not shifted.	
			Angle	The package is not cracked, the contents are not damaged and not shifted.	
2	Gross Weight Measure	* UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(18th) special provisions 188	386.3g		Passed

B. Sample Description

Dimensions	246*138*36mm	Net Weight of Batteries	320g	Battery Type	Rechargeable Li-Polymer Battery
Gross weight	386.3g	Battery number	2Pcs/Carton	** Description	Carton box

C. Image After Test

* Recommendations on the transport of dangerous goods as below
Each package of cells or batteries, or the completed package must be capable of withstanding a 1.2 m drop test in any orientation without:
1) damage to cells or batteries contained therein
2) shifting of the contents so as to allow battery to battery (or cell to cell) contact
3) release of contents.

** Description: Description about the protection of short-circuit

Appendix 2. 1.2m Drop Test Report

A. Test Result

No	Name of Test Items	Standard requirement or The Clause Number of Standard	Test Result		Conclusion
1	1.2m Drop Test	* UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(18th) special provisions 188	Face	The package is not cracked, the contents are not damaged and not shifted.	Passed
			Edge	The package is not cracked, the contents are not damaged and not shifted.	
			Angle	The package is not cracked, the contents are not damaged and not shifted.	
2	Gross Weight Measure	* UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(18th) special provisions 188	6.522 kg		Passed

B. Sample Description

Dimensions	300*270*320mm	**Net Weight of Batteries**	5.116 kg	**Battery Type**	Rechargeable Li-Polymer Battery
Gross weight	6.522 kg	**Battery number**	32Pcs/Carton	**** Description**	Carton box

C. Image After Test

* Recommendations on the transport of dangerous goods as below
Each package of cells or batteries, or the completed package must be capable of withstanding a 1.2 m drop test in any orientation without:
1) damage to cells or batteries contained therein
2) shifting of the contents so as to allow battery to battery (or cell to cell) contact
3) release of contents.

** Description: Description about the protection of short-circuit