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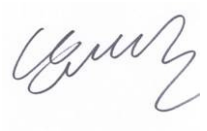
CERTIFICATE OF COMPLIANCE

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	**L14L3P21**
Cell Model name	**ICP595490L1**
Nominal voltage	**11.1 V**
Electric power capacity	**45 Wh**
Lithium Content	**1.215g**

Conducted By: Dae Ho Nam



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UN Test Report
- L14L3P21(Nom.45Wh, 11.1V)-

목 차

2014. 08. 26

LG Chem

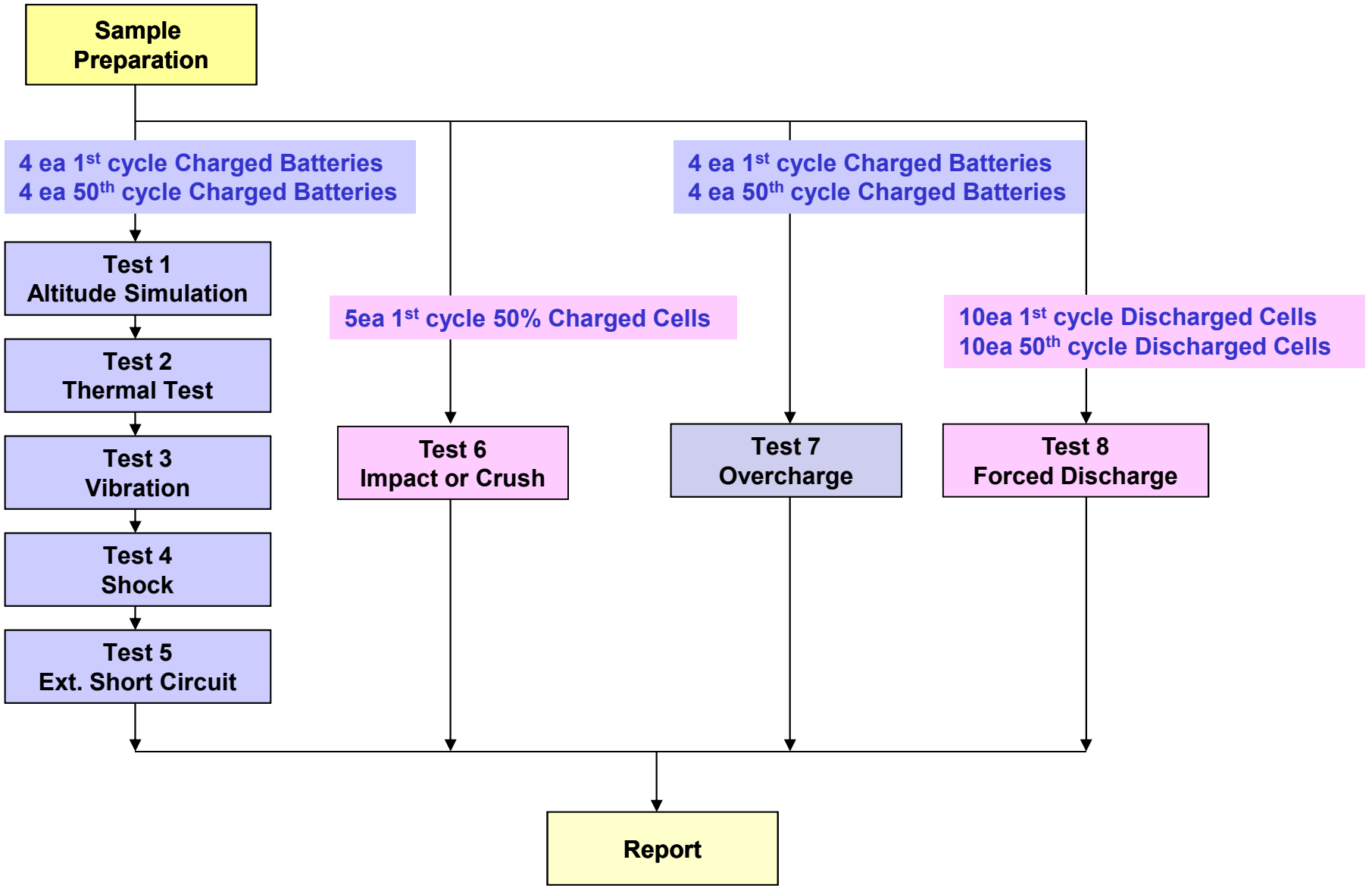
1. UN Transportation Regulation Test

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	12.587	219.500	12.569	219.491	99.86	0.004	Pass	12.414	219.473	98.76	0.008	Pass	12.411	219.469	99.98	0.002	Pass	12.410	219.456	99.99	0.006	Pass
	2	12.545	219.898	12.530	219.894	99.88	0.001	Pass	12.364	219.892	98.67	0.001	Pass	12.360	219.885	99.97	0.003	Pass	12.359	219.883	99.99	0.001	Pass
	3	12.539	219.305	12.523	219.282	99.88	0.011	Pass	12.360	219.253	98.70	0.013	Pass	12.357	219.235	99.98	0.008	Pass	12.353	219.222	99.97	0.006	Pass
	4	12.548	219.023	12.525	219.019	99.81	0.002	Pass	12.378	219.006	98.83	0.006	Pass	12.375	218.993	99.98	0.006	Pass	12.375	218.975	100.00	0.008	Pass
	Ave.	12.555	219.432	12.537	219.421	99.86	0.005	-	12.379	219.406	98.74	0.007	-	12.376	219.396	99.97	0.005	-	12.374	219.384	99.99	0.005	-
B. 50th cycle fully state																							
Charge	5	12.558	219.281	12.541	219.271	99.87	0.004	Pass	12.397	219.271	98.85	0.000	Pass	12.394	219.262	99.98	0.004	Pass	12.389	219.255	99.96	0.003	Pass
	6	12.558	219.815	12.539	219.797	99.85	0.008	Pass	12.388	219.795	98.79	0.001	Pass	12.384	219.777	99.97	0.008	Pass	12.381	219.757	99.98	0.009	Pass
	7	12.559	219.161	12.545	219.140	99.89	0.009	Pass	12.378	219.133	98.67	0.003	Pass	12.376	219.131	99.98	0.001	Pass	12.375	219.122	99.99	0.004	Pass
	8	12.553	219.170	12.537	219.165	99.87	0.002	Pass	12.391	219.145	98.84	0.009	Pass	12.390	219.136	99.99	0.004	Pass	12.386	219.127	99.97	0.004	Pass
	Ave.	12.557	219.356	12.540	219.343	99.87	0.006	-	12.389	219.336	98.79	0.003	-	12.386	219.327	99.98	0.004	-	12.383	219.315	99.97	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	12.410	56.23	Pass
	2	12.359	55.6	Pass
	3	12.353	56.03	Pass
	4	12.375	54.76	Pass
	MAX.	12.410	56.23	-

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	5	12.389	55.31	Pass
	6	12.381	55.71	Pass
	7	12.375	55.85	Pass
	8	12.386	55.99	Pass
	MAX.	12.389	55.99	-

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	12.542	23.72	Pass
	10	12.542	23.65	Pass
	11	12.541	24.47	Pass
	12	12.540	24.92	Pass
	MAX.	12.542	24.92	-

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	13	12.527	25.22	Pass
	14	12.528	24.13	Pass
	15	12.529	24.77	Pass
	16	12.525	24.05	Pass
	MAX.	12.529	25.22	-

Test Condition
- Max. Charge Current : 2100mA - CC/CV 2Imax(4200mA) 22V 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	505g		Passed

B. Sample Description

Dimensions	246*138*36mm	**Net Weight of Batteries**	438g	**Battery Type**	Rechargeable Li-Polymer Battery
Gross weight	505g	**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	8.414 kg		Passed

B. Sample Description

Dimensions	300*270*320mm	**Net Weight of Batteries**	5.400 kg	**Battery Type**	Rechargeable Li-Polymer Battery
Gross weight	8.414kg	**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