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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	**L15L4P71**
Cell Model name	**ICP297576L1**
Nominal voltage	**7.6 V**
Electric power capacity	**40 Wh**
Lithium equivalent content	**1.60g**

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UN Test Report
-L15L4P71(Nom. 40Wh, 7.6V)-

목 차

2015. 06. 02

LG Chem

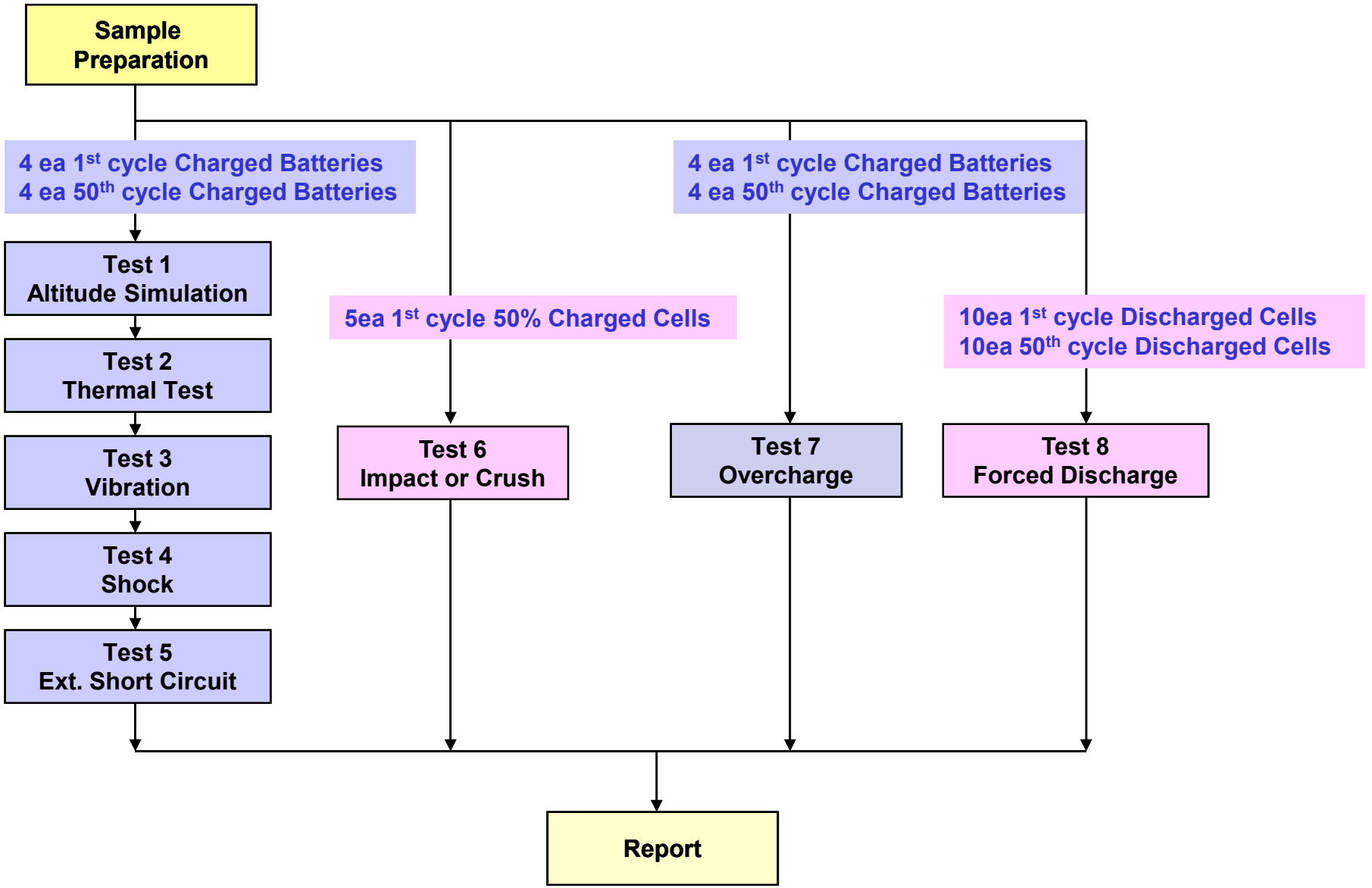
1. UN Transportation Regulation Test

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 charged state																							
Charge	**1**	8.680	175.00	8.678	174.99	99.98	0.006	**Pass**	8.569	174.98	98.74	0.006	**Pass**	8.568	174.97	99.99	0.006	**Pass**	8.567	174.97	99.99	0.000	**Pass**
	2	8.643	175.79	8.641	175.79	99.98	0.000	**Pass**	8.530	175.78	98.72	0.006	**Pass**	8.529	175.77	99.99	0.006	**Pass**	8.529	175.76	100.00	0.006	**Pass**
	3	8.645	175.96	8.643	175.95	99.98	0.006	**Pass**	8.534	175.94	98.74	0.006	**Pass**	8.533	175.93	99.99	0.006	**Pass**	8.532	175.92	99.99	0.006	**Pass**
	4	8.641	175.38	8.640	175.37	99.99	0.006	**Pass**	8.531	175.36	98.74	0.006	**Pass**	8.530	175.35	99.99	0.006	**Pass**	8.528	175.34	99.98	0.006	**Pass**
	Ave.	8.652	175.53	8.651	175.53	99.98	0.004	-	8.541	175.52	98.73	0.006	-	8.540	175.51	99.99	0.006	-	8.539	175.50	99.99	0.004	-
B. 50th cycle fully charged state																							
Charge	**5**	8.651	175.01	8.649	175.01	99.98	0.000	**Pass**	8.540	174.99	98.74	0.011	**Pass**	8.539	174.99	99.99	0.000	**Pass**	8.539	174.99	100.00	0.000	**Pass**
	6	8.669	175.73	8.668	175.73	99.99	0.000	**Pass**	8.559	175.71	98.74	0.011	**Pass**	8.557	175.71	99.98	0.000	**Pass**	8.556	175.70	99.99	0.006	**Pass**
	7	8.654	174.95	8.652	174.95	99.98	0.000	**Pass**	8.545	174.94	98.76	0.006	**Pass**	8.544	174.94	99.99	0.000	**Pass**	8.543	174.93	99.99	0.006	**Pass**
	8	8.650	175.06	8.648	175.05	99.98	0.006	**Pass**	8.540	175.04	98.75	0.006	**Pass**	8.539	175.03	99.99	0.006	**Pass**	8.538	175.03	99.99	0.000	**Pass**
	Ave.	8.656	175.19	8.654	175.19	99.98	0.001	-	8.546	175.17	98.75	0.009	-	8.545	175.17	99.99	0.001	-	8.544	175.16	99.99	0.003	-

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 charged state				
Charge	1	8.567	56.51	Pass
	2	8.529	56.52	Pass
	3	8.532	55.97	Pass
	4	8.528	56.24	Pass
	MAX.	8.567	56.52	-

EXT.Short Circuit (T5)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully charged state				
Charge	5	8.539	56.62	Pass
	6	8.556	56.52	Pass
	7	8.543	55.79	Pass
	8	8.538	55.43	Pass
	MAX.	8.556	56.62	-

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 charged state				
Charge	9	8.674	24.60	Pass
	10	8.655	25.00	Pass
	11	8.652	24.95	Pass
	12	8.643	23.23	Pass
	MAX.	8.674	25.00	-

Over Charge (T7)				
	NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully charged state				
Charge	13	8.642	24.53	Pass
	14	8.670	23.22	Pass
	15	8.668	23.68	Pass
	16	8.655	23.04	Pass
	MAX.	8.670	24.53	-

Test Condition
- Max. Charge Current : 2670mA - CC/CV 2Imax(5340mA)17.4V cut-off 24Hr

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

3-3. T6/T8 Test Result (ICP297576L1)

Crush (T6)				
Direction	NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state				
Flat	C-1	3.821	23.09	Pass
	C-2	3.818	23.04	Pass
	C-3	3.822	23.05	Pass
	C-4	3.820	23.13	Pass
	C-5	3.821	23.09	Pass
MAX.		3.822	23.13	-

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) : 1335mA Duration time: rated capacity (120min)

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

4. Sample Image