
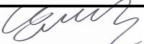



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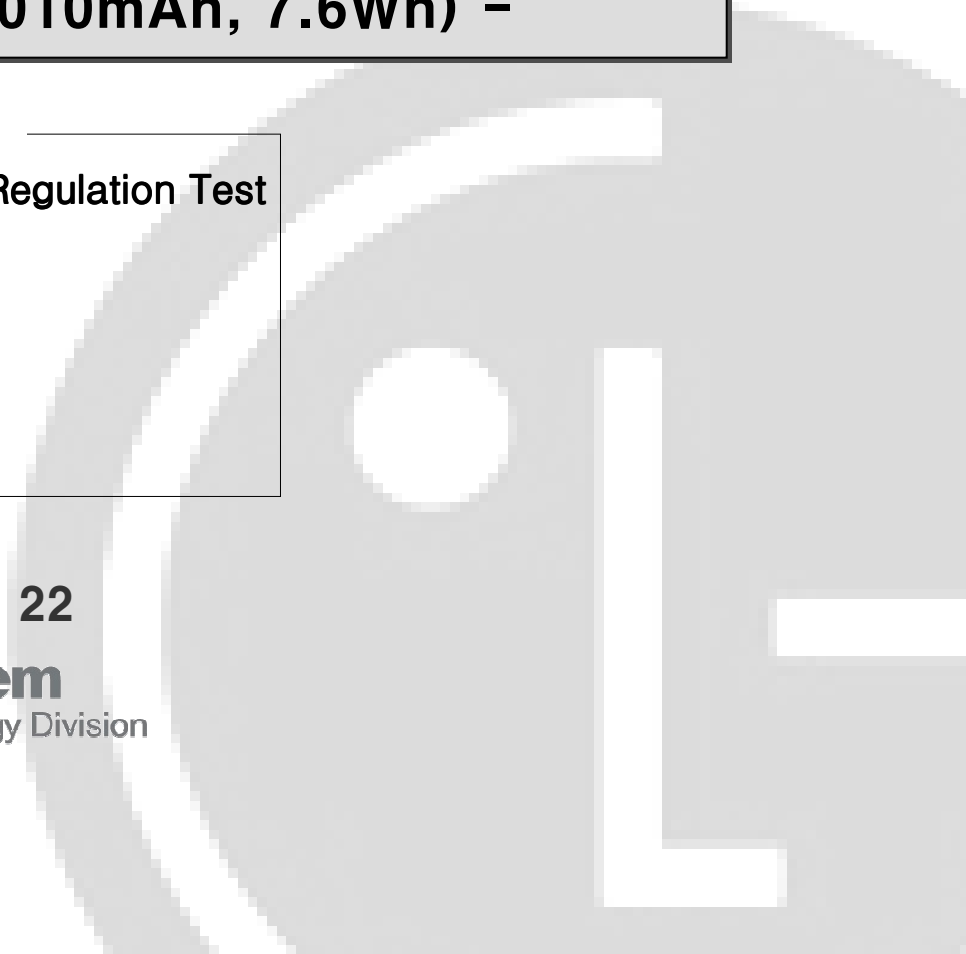
# UN Test Report

## - ED30 (ICP364981A1, 2010mAh, 7.6Wh) -

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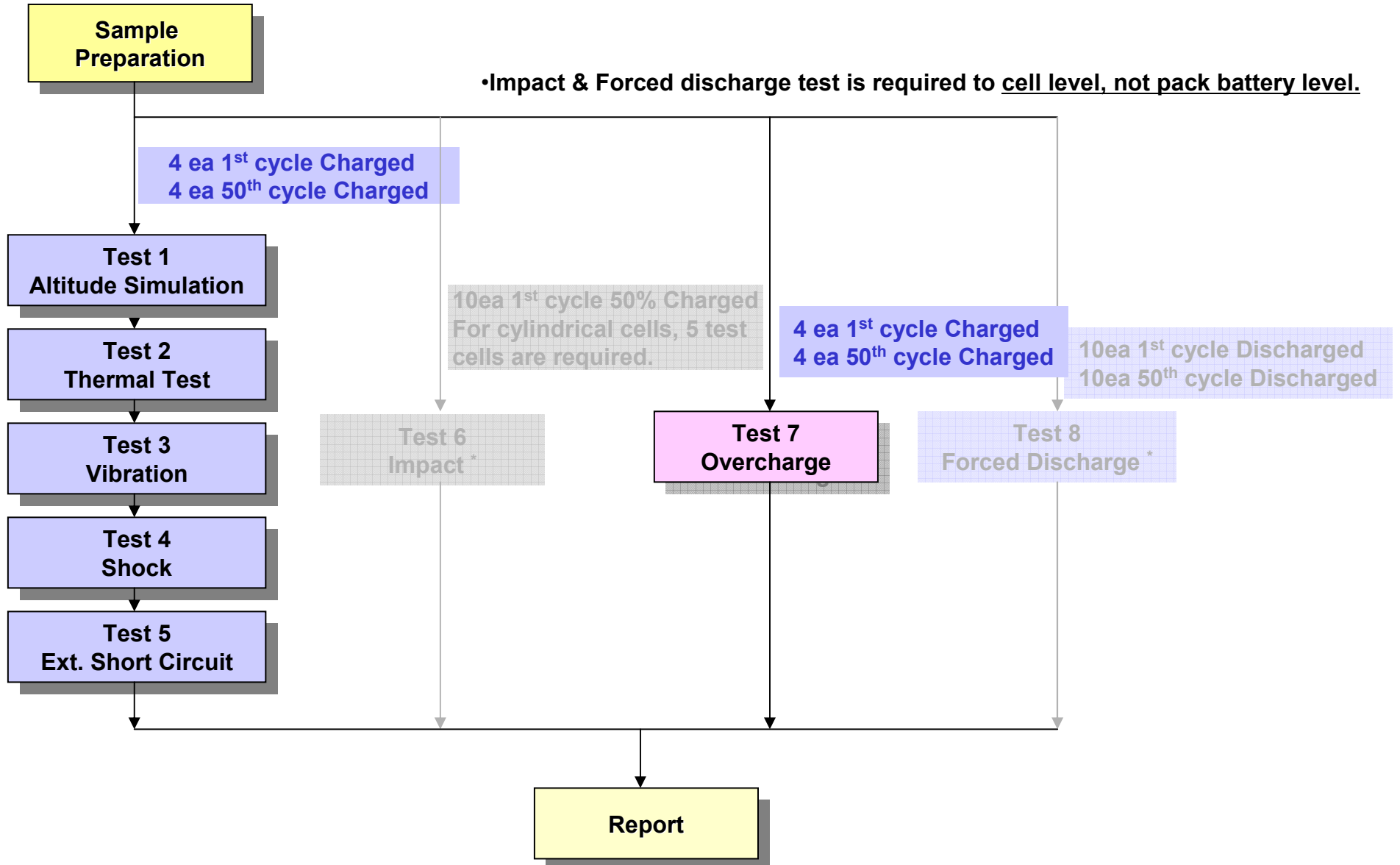
# 1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure) 11.6kPa for 6hr at 20+/-5 °C	<ul style="list-style-type: none"> <li>- Measuring mass before/ after each test (If M&gt;5g, less than 0.1%)</li> <li>- Measuring voltage before/ after each test (more than 90%)</li> <li>- No leakage, no venting, no disassembly, no rupture, no fire</li> </ul>
Test 2. Thermal Test	[75±2 °C, 6hr ↔ -40 ± 2 °C, 6hr, interval max. 30min] x 10 cycle Storing at 20±5 °C 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 °C 1hr continue after returning at 55±2 °C	<ul style="list-style-type: none"> <li>- No disassembly, no rupture, no fire (after 6 hours)</li> <li>- Temp. monitoring (max. 170 °C)</li> </ul>
Test 6. Impact	Only for Cell, not battery.	
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)	<ul style="list-style-type: none"> <li>- No disassembly, no fire (after 7 days)</li> </ul>
Test 8. Forced Discharge	Only for Cell, not battery.	

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

\* 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)

# 2. Test Procedure



# 3-1. T1-T4 Test Result

Before			Altitude (T1)					Thermal (T2)					Vibration (T3)					Shock (T4)				
Pack 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	4.322	32.695	4.319	32.694	99.93	0.003	Pass	4.258	32.689	98.59	0.015	Pass	4.257	32.686	99.98	0.009	Pass	4.256	32.684	99.98	0.006	Pass
	2	4.322	32.795	4.316	32.792	99.86	0.009	Pass	4.257	32.788	98.63	0.012	Pass	4.255	32.786	99.95	0.006	Pass	4.254	32.785	99.98	0.003	Pass
	3	4.321	32.792	4.313	32.791	99.81	0.003	Pass	4.256	32.788	98.68	0.009	Pass	4.253	32.785	99.93	0.009	Pass	4.252	32.785	99.98	0.000	Pass
	4	4.322	32.766	4.312	32.766	99.77	0.000	Pass	4.249	32.760	98.54	0.018	Pass	4.247	32.758	99.95	0.006	Pass	4.243	32.755	99.91	0.009	Pass
	Ave.	4.322	32.762	4.315	32.761	99.84	0.004	-	4.255	32.756	98.61	0.014	-	4.253	32.754	99.95	0.008	-	4.251	32.752	99.96	0.005	-

## B. 50th cycle fully state

Charge	1	4.314	32.689	4.311	32.688	99.93	0.003	Pass	4.247	32.686	98.52	0.006	Pass	4.245	32.686	99.95	0.000	Pass	4.244	32.683	99.98	0.009	Pass
	2	4.312	32.787	4.308	32.786	99.91	0.003	Pass	4.247	32.784	98.58	0.006	Pass	4.246	32.783	99.98	0.003	Pass	4.244	32.781	99.95	0.006	Pass
	3	4.311	32.787	4.306	32.784	99.88	0.009	Pass	4.246	32.782	98.61	0.006	Pass	4.245	32.782	99.98	0.000	Pass	4.243	32.78	99.95	0.006	Pass
	4	4.312	32.699	4.307	32.698	99.88	0.003	Pass	4.246	32.694	98.58	0.012	Pass	4.243	32.691	99.93	0.009	Pass	4.241	32.688	99.95	0.009	Pass
	Ave.	4.312	32.741	4.308	32.739	99.90	0.005	-	4.247	32.737	98.57	0.008	-	4.245	32.736	99.96	0.003	-	4.243	32.733	99.96	0.008	-

### Requirement

- Measuring mass before/after each test (If M>5g, less than 0.1%)
- 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)				
	Pack NO.	Initial OCV(V)	Max. Temp (°C)	Result

## A. 1st cycle fully state

Charge	1	4.256	55.89	Pass
	2	4.254	55.45	Pass
	3	4.252	54.32	Pass
	4	4.243	54.84	Pass
	MAX.	4.256	55.89	-

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

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

## A. 1st cycle fully state

Charge	9	4.323	21.67	Pass
	10	4.322	21.54	Pass
	11	4.321	22.68	Pass
	12	4.323	21.46	Pass
	MAX.	4.323	22.68	-

Test Condition
- Max. Charge Current : 2010mA - CC/CV 2Imax(4020mA) 8.7V cut-off 24Hr

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

## B. 50th cycle fully state

Charge	5	4.244	56.76	Pass
	6	4.244	55.88	Pass
	7	4.243	55.71	Pass
	8	4.241	56.19	Pass
	MAX.	4.244	56.76	-

Requirement
- Temperature < 170 (°C) - No disassembly, no rupture, no fire within 6 hours

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

## B. 50th cycle fully state

Charge	13	4.318	23.01	Pass
	14	4.316	22.98	Pass
	15	4.317	21.12	Pass
	16	4.317	21.04	Pass
	MAX.	4.318	23.01	-

Requirement
- No disassembly, no fire within 7 day

# 3-3. T6 Test Result (ICP364981A1)

Impact (T6)			
Pack NO.	Initial OCV(V)	Max. Temp (°C)	Result

## A. 1st cycle 50% charged state

1	3.806	114.53	Pass
2	3.807	104.95	Pass
3	3.808	114.38	Pass
4	3.808	104.35	Pass
5	3.807	103.29	Pass
6	3.806	118.54	Pass
7	3.806	109.78	Pass
8	3.808	108.53	Pass
9	3.807	111.40	Pass
10	3.807	118.97	Pass
<b>MAX.</b>	3.808	118.97	-

Test Condition
- $\Phi=15.8\text{mm}$ bar, 9.1kg mass, $61\pm 2.5\text{cm}$ height

Requirement
- Temperature < 170 (°C) - No disassembly, no rupture, no fire within 6 hours

## 4. Sample Image



**Manufacturer:**

LG Chemical, Ltd.

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Website: [www.lgchem.com](http://www.lgchem.com)

Email: [kimhwans@lgchem.com](mailto:kimhwans@lgchem.com)



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