



LG Chem, Ltd.
128, Yeoui-daero, Yeongdeungpo-gu,
Seoul, Korea

Certification & Evaluation Team
Tel: 82-42-870-6195, Fax: 82-42-863-0182
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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 type="checkbox"/> Lithium-ion battery <input checked="" type="checkbox"/> Lithium-ion single cell battery	
Model name	EY30
Cell Model name	ICP286291L1
Nominal voltage	3.8 V
Electric power capacity	8.2 Wh

Conducted By: Dae Ho Nam

Manager
Certification & Evaluation
LG Chem, Ltd.
E-mail: kkammy@lgchem.com

Reviewed By: Byung Soo Kim

General Manager
Certification & Evaluation
LG Chem, Ltd.
E-mail: bskim@lgchem.com

문서번호	QAE-EF02-150114-PKEY30	
Prepared	남익현	
	장승현	
Reviewed	남대호	
	우민제	
Approved	김병수	

SolutionPartner

UN Test Report

- EY30(Min. 8.2Wh, 3.8V) -

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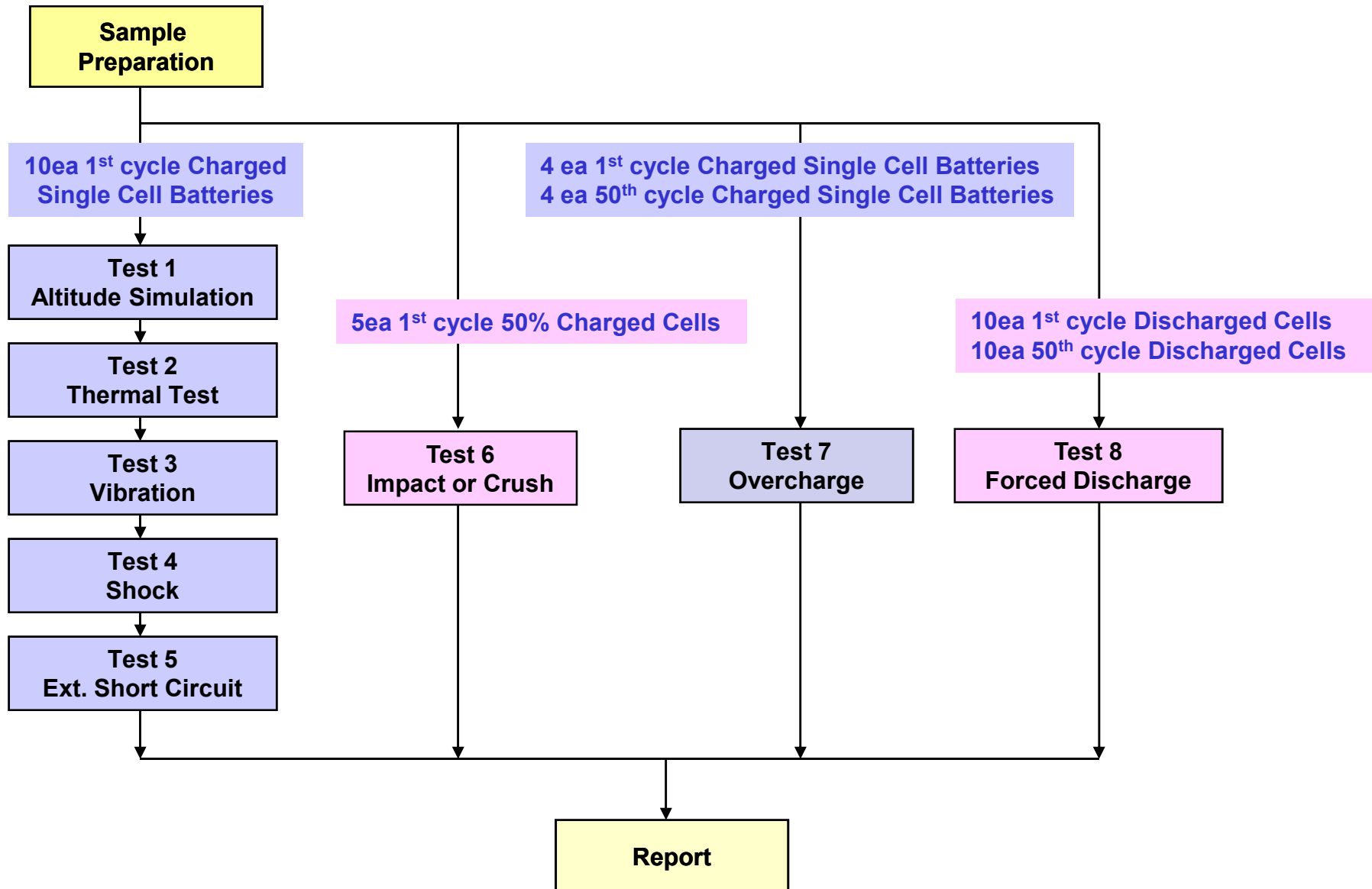
1. UN Transportation Regulation Test

Test	Condition	Requirements
Test 1. Altitude Simulation	Storing at (low pressure)11.6kPa for 6hr at 20+/-5℃	- Measuring mass before/ after each test (If $M < 1g$, less than 0.5%, If $1g \leq M \leq 75g$, 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 charged state

1	4.323	34.758	4.322	34.757	99.98	0.003	Pass	4.259	34.757	98.54	0.000	Pass	4.259	34.756	100.00	0.003	Pass	4.259	34.756	100.00	0.000	Pass
2	4.322	34.713	4.321	34.712	99.98	0.003	Pass	4.258	34.711	98.54	0.003	Pass	4.257	34.710	99.98	0.003	Pass	4.255	34.709	99.95	0.003	Pass
3	4.324	34.745	4.323	34.743	99.98	0.006	Pass	4.262	34.742	98.59	0.003	Pass	4.262	34.741	100.00	0.003	Pass	4.262	34.740	100.00	0.003	Pass
4	4.324	34.757	4.323	34.755	99.98	0.006	Pass	4.260	34.754	98.54	0.003	Pass	4.260	34.753	100.00	0.003	Pass	4.259	34.753	99.98	0.000	Pass
5	4.324	34.749	4.324	34.748	100.00	0.003	Pass	4.263	34.746	98.59	0.006	Pass	4.262	34.745	99.98	0.003	Pass	4.260	34.745	99.95	0.000	Pass
6	4.324	34.703	4.323	34.701	99.98	0.006	Pass	4.262	34.700	98.59	0.003	Pass	4.261	34.699	99.98	0.003	Pass	4.260	34.699	99.98	0.000	Pass
7	4.324	34.710	4.324	34.708	100.00	0.006	Pass	4.260	34.707	98.52	0.003	Pass	4.260	34.706	100.00	0.003	Pass	4.260	34.704	100.00	0.006	Pass
8	4.323	34.702	4.323	34.701	100.00	0.003	Pass	4.259	34.701	98.52	0.000	Pass	4.259	34.701	100.00	0.000	Pass	4.258	34.701	99.98	0.000	Pass
9	4.324	34.733	4.323	34.733	99.98	0.000	Pass	4.262	34.732	98.59	0.003	Pass	4.261	34.730	99.98	0.006	Pass	4.260	34.729	99.98	0.003	Pass
10	4.324	34.764	4.323	34.762	99.98	0.006	Pass	4.261	34.762	98.57	0.000	Pass	4.260	34.761	99.98	0.003	Pass	4.259	34.760	99.98	0.003	Pass
Ave.	4.324	34.733	4.323	34.732	99.98	0.004	-	4.261	34.731	98.56	0.002	-	4.260	34.730	99.99	0.003	-	4.259	34.730	99.98	0.002	-

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 charged state

1	4.259	55.75	Pass
2	4.255	55.75	Pass
3	4.262	55.58	Pass
4	4.259	55.28	Pass
5	4.260	54.93	Pass
6	4.260	55.46	Pass
7	4.260	55.10	Pass
8	4.258	54.88	Pass
9	4.260	54.91	Pass
10	4.259	55.56	Pass
MAX.	4.262	55.75	-

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

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

A. 1st cycle fully charged state

Charge	11	4.324	22.62	Pass
	12	4.322	23.03	Pass
	13	4.322	22.58	Pass
	14	4.323	22.79	Pass
	MAX.	4.324	23.03	-

Test Condition
- Max. Charge Current : 2330mA - CC/CV 2Imax(4660mA) 8.7V cut-off 24Hr

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

B. 50th cycle fully charged state

Charge	15	4.317	23.25	Pass
	16	4.318	23.50	Pass
	17	4.317	23.61	Pass
	18	4.317	23.78	Pass
	MAX.	4.318	23.78	-

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

3-3. T6/T8 Test Result (ICP286291L1)

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

A. 1st cycle 50% charged state

Flat	C-1	3.647	23.50	Pass
	C-2	3.647	23.45	Pass
	C-3	3.648	24.10	Pass
	C-4	3.647	24.08	Pass
	C-5	3.648	24.10	Pass
MAX.		3.648	24.10	-

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	3.316	83.11	Pass
C-7	3.321	82.92	Pass
C-8	3.319	79.88	Pass
C-9	3.317	80.27	Pass
C-10	3.324	79.33	Pass
C-11	3.319	83.05	Pass
C-12	3.318	81.22	Pass
C-13	3.321	78.65	Pass
C-14	3.317	78.25	Pass
C-15	3.315	79.14	Pass
MAX.	3.324	83.11	-

B. 50th cycle fully discharged state

C-16	3.453	85.97	Pass
C-17	3.451	87.99	Pass
C-18	3.461	88.61	Pass
C-19	3.448	89.91	Pass
C-20	3.453	85.31	Pass
C-21	3.453	90.03	Pass
C-22	3.450	86.59	Pass
C-23	3.499	87.86	Pass
C-24	3.487	88.56	Pass
C-25	3.455	89.53	Pass
MAX.	3.499	90.03	-

Test Condition
- Discharge at max. discharge current (with 12V DC power supply) : 2230mA Duration time: rated capacity (60min)

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

4. Sample Image

