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リチウムイオン電池認証書
Lithium-ion rechargeable (polymer) cell or battery Certification

No: SEW-CB13198
Date:2013-12-23

1．■単電池／□single cell　■single cell battery
□組電池／battery(pack)（セル構成／composition of cell：1P1S　）

2．機種名／customer model name：EL40　　Sony model name：LIS1544MRPC

3．顧 客 名／customer：MOTOROLA

4．国連勧告テスト結果／Test results of the UN Recommendations on the Transport of Dangerous Goods

国連勧告テスト及び判定基準（38.3 リチウム電池）		テスト結果/ test results	備考／remarks
NO	テスト項目 test item		
T1	高度シミュレーション／Altitude simulation	OK	
T2	温度試験／Thermal test	OK	
T3	振動／Vibration	OK	
T4	衝撃／Shock	OK	
T5	外部短絡／External short circuit	OK	
T6	衝突（Impact）／圧壊（Crush）	OK	
T7	過充電／Overcharge	OK	single cell は対象外
T8	強制放電／Forced discharge	OK	

試験実施日／Tested Date：2013/12/9~2013/12/19
梱包試験実施日／Tested Date for Package：2013/11/11~2013/11/14

5．定格／rated

項目／item	規格値／specification	備考／remarks
公称電圧／nominal voltage	3.8V	
定格容量／rated capacity	1860mAh	
ワート時定格値(Wh) ／Watt-hour rating	7.4Wh	単電池≦20Wh 組電池≦100Wh cells ≦20Wh batteries≦100Wh

上記テスト結果は国連勧告試験(UN Manual of Tests and Criteria 5th revised edition Amendment 1, Part Ⅲ, sub-section 38.3)に従い確認した結果であることを証明いたします。
We, Sony Electronics (Wuxi) Co., Ltd., hereby certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods, 5th revised edition Amendment 1,Part Ⅲ, sub-section 38.3.

Weiwei Tang /Senior Manager
Quality Assurance Department
Sony Electronics (Wuxi) Co., Ltd.

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国联劝告 结果 1
Test Result of UN Recommendations Part 1

机种名/Sony Model Name	LIS1544MRPC		
cell使用/Cell Model Name	US405074H2	构成/Configuration	1P 1S
试验场所/Test Company	索尼电子(无锡)有限公司		
地址/ Address	中国江苏省无锡市新区长江路27号	电话/Tel	86-18068308951
试验室/Test Room	SEW国联劝告试验室	试验期间/Test Dates	2013.12.9-2013.12.19
判定基准/Criterion	UN Manual of Tests and Criteria Rev5, Part Ⅲ, sub-section 38.3		

试验名称/Test Name		T1:高度模拟试验 Altitude Simulation			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.32	4.295	99.5	N
2		4.321	4.298	99.5	N
3		4.319	4.299	99.5	N
4		4.312	4.306	99.9	N
5		4.316	4.308	99.8	N
6		4.319	4.312	99.8	N
7		4.309	4.302	99.8	N
8		4.315	4.310	99.9	N
9		4.313	4.309	99.9	N
10		4.312	4.308	99.9	N

试验名称/Test Name		T2:温度试验 Thermal			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.295	4.245	98.8	N
2		4.298	4.248	98.8	N
3		4.299	4.245	98.7	N
4		4.306	4.244	98.6	N
5		4.308	4.235	98.3	N
6		4.312	4.251	98.6	N
7		4.302	4.230	98.3	N
8		4.310	4.248	98.6	N
9		4.309	4.250	98.6	N
10		4.308	4.248	98.6	N

试验名称/Test Name		T3:振动试验 Vibration			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.245	4.241	99.9	N
2		4.248	4.243	99.9	N
3		4.245	4.242	99.9	N
4		4.244	4.243	100.0	N
5		4.235	4.231	99.9	N
6		4.251	4.244	99.8	N
7		4.230	4.228	100.0	N
8		4.248	4.245	99.9	N
9		4.250	4.243	99.8	N
10		4.248	4.244	99.9	N

现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 排气:V <Venting> 渗漏:L <Leakage> 无异常:N <No rupture, No fire, No disassembly, No venting, No leakage>

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国联劝告试验 结果 2
Test Result of UN Recommendations Part 2

试验名称/Test Name	T4:冲击试验 Shock			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.241	4.240	100.0	N
2		4.243	4.243	100.0	N
3		4.242	4.242	100.0	N
4		4.243	4.242	100.0	N
5		4.231	4.231	100.0	N
6		4.244	4.243	100.0	N
7		4.228	4.228	100.0	N
8		4.245	4.244	100.0	N
9		4.243	4.243	100.0	N
10		4.244	4.244	100.0	N
现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 排气:V <Venting> 渗漏:L <Leakage> 无异常:N <No rupture, No fire, No disassembly, No venting, No leakage>				

试验名称/Test Name	T5:外短路试验 External Short Circuit					
番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence	番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence
1	初回满充电/ First cycle, fully charged	55.7℃	N	6	初回满充电/ First cycle, fully charged	55.6℃	N
2		55.3℃	N	7		55.3℃	N
3		55.3℃	N	8		55.3℃	N
4		55.3℃	N	9		55.3℃	N
5		55.3℃	N	10		55.3℃	N
现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 无异常:N <No rupture, No fire, No disassembly>						

试验名称/Test Name	T6: 撞击(impact)/挤压(crush) 试验		
番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence
1	初回 50%充电 (宽面)/ First cycle, 50% charged (wide surface)	<160℃	N
2		<160℃	N
3		<160℃	N
4		<160℃	N
5		<160℃	N
现象/Occurrence	解体: D <Disassembly> 起火: F <Fire> 无异常: N <No fire, No disassembly>		

试验名称/Test Name	T7:过充电试验 Overcharge			
番号 No.	电池状态 Conditions	现象确认/Occurrence	番号 No.	电池状态 Conditions	现象确认/Occurrence
1	初回满充电/ First cycle, fully charged	N	5	50次循环后 满充电/ After 50 cycles, fully charged	N
2		N	6		N
3		N	7		N
4		N	8		N
现象/Occurrence	起火:F <Fire> 解体:D <Disassembly> 无异常:N <No fire, No disassembly>				

* Temperature Measurement by Thermolabel

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国联劝告试验 结果 3

Test Result of UN Recommendations Part 3

试验名称 /Test Name	T8: 强制放电 Forced Discharge				
番号 N	电池状态 Conditions	现象确认 /Occurrence	番号 N	电池状态 Conditions	现象确认 /Occurrence
1	初次循环 完全放电 / First cycle, fully discharged	N	11	50次循环后 完全放电 / After 50 cycles, fully discharged	N
2		N	12		N
3		N	13		N
4		N	14		N
5		N	15		N
6		N	16		N
7		N	17		N
8		N	18		N
9		N	19		N
10		N	20		N
现象 / Occurrence	起火:F <Fire> 解体:D <Disassembly> 无异常:N <No fire, No disassembly>				

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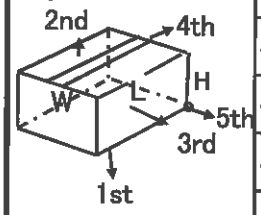
国連勧告試験 梱包結果
Test Result of UN Recommendations for Package

試験場所/ Test Company	索尼电子(无锡)有限公司				
住所/ Address	中国江苏省无锡市新区长江路27号			電話/ Tel	86-18068308951
試験室/ Test Room	SEW国联劝告试验室	試験期間/ Test Dates	2013.11.11-2013.11.14	試験番号 /Test N	SEW-CB13198
機種名/ Sony Model Name	LIS1544MRPC		梱包入り数 /Quantity		160 pcs
使用セル/ Cell Model Name	US405074H2	構成/ Configuration	1P1S	梱包製造所/ Package Factor	SEW
包装等級 / Packing Group	等級Ⅱ /Packing Group Number Ⅱ				

寸法・質量 / Dimensions and Gross Weight	長辺/Length(L)	短辺 /Wide (W)	高さ/Height (H)	質量 /Gross Weight (kg)
	400 mm	300 mm	160 mm	9.0 kg

■ 落下試験/Drop Test

試験設備	HORAD PD-315			
試験条件/ Test condition	落下高さ /Drop height	1．2m	試験結果 /Occurrence	
落下姿勢(方向)/ Five (one for each drop) 	1回目の落下試験	底面を水平に/ flat on the bottom	著しい破損なし/No Leakage, No damege liable to affect safety during	
	2回目の落下試験	天面を水平に / flat on the top	著しい破損なし/No Leakage, No damege liable to affect safety during	
	3回目の落下試験	長側面を水平に/ flat on the long side	著しい破損なし/No Leakage, No damege liable to affect safety during	
	4回目の落下試験	短側面を水平に/ flat on the short side	著しい破損なし/No Leakage, No damege liable to affect safety during	
	5回目の落下試験	コーナー(角)※/ on a corner	著しい破損なし/No Leakage, No damege liable to affect safety during	
	※コーナー:容器が最も破損を受ける方向を選択			
判定基準/ Criterion	外装容器及び袋の場合、外装容器の最も外側の層に輸送中の安全を脅かすようないかなる破損が生じてはならない。		判定/ Judgment	合格/OK

■ 積み重ね試験/Stacking Test

試験条件/Test condition	No	試験結果 /Occurrence
試験荷重値/Weight Load 165 kg	1	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
	2	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
	3	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration

判定基準/ Criterion	試供品は漏洩があってはならない。試供品は、輸送の安全性を損なうような劣化、又はその強度を減じたり、又は輸送物の積重ねを不安定にするような歪みが生じてはならない。	判定/ Judgment	合格/OK

Weiwei Tang

WeiWei Tang / Senior Manager
Quality Assurance Department
Sony Electronics (Wuxi) Co., Ltd.

品保-P检-022(3)

総合判定
合格/OK

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Phone: 86-510-8523-9120 / Fax: 86-510-8523-8505

リチウムイオン電池認証書
Lithium-ion rechargeable (polymer) cell or battery Certification

No: SEW-CB13198
Date:2013-12-23

1．■単電池／□single cell　■single cell battery
□組電池／battery(pack)（セル構成／composition of cell：1P1S　）

2．機種名／customer model name：EL40　　Sony model name：LIS1544MRPC

3．顧 客 名／customer：MOTOROLA

4．国連勧告テスト結果／Test results of the UN Recommendations on the Transport of Dangerous Goods

国連勧告テスト及び判定基準（38.3 リチウム電池）		テスト結果/ test results	備考／remarks
NO	テスト項目 test item		
T1	高度シミュレーション／Altitude simulation	OK	
T2	温度試験／Thermal test	OK	
T3	振動／Vibration	OK	
T4	衝撃／Shock	OK	
T5	外部短絡／External short circuit	OK	
T6	衝突（Impact）／圧壊（Crush）	OK	
T7	過充電／Overcharge	OK	single cell は対象外
T8	強制放電／Forced discharge	OK	

試験実施日／Tested Date：2013/12/9~2013/12/19
梱包試験実施日／Tested Date for Package：2013/11/11~2013/11/14

5．定格／rated

項目／item	規格値／specification	備考／remarks
公称電圧／nominal voltage	3.8V	
定格容量／rated capacity	1860mAh	
ワート時定格値(Wh) ／Watt-hour rating	7.4Wh	単電池≦20Wh 組電池≦100Wh cells ≦20Wh batteries≦100Wh

上記テスト結果は国連勧告試験(UN Manual of Tests and Criteria 5th revised edition Amendment 1, Part Ⅲ, sub-section 38.3)に従い確認した結果であることを証明いたします。
We, Sony Electronics (Wuxi) Co., Ltd., hereby certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods, 5th revised edition Amendment 1,Part Ⅲ, sub-section 38.3.

Weiwei Tang /Senior Manager
Quality Assurance Department
Sony Electronics (Wuxi) Co., Ltd.

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国联劝告 结果 1
Test Result of UN Recommendations Part 1

机种名/Sony Model Name	LIS1544MRPC		
cell使用/Cell Model Name	US405074H2	构成/Configuration	1P 1S
试验场所/Test Company	索尼电子(无锡)有限公司		
地址/ Address	中国江苏省无锡市新区长江路27号	电话/Tel	86-18068308951
试验室/Test Room	SEW国联劝告试验室	试验期间/Test Dates	2013.12.9-2013.12.19
判定基准/Criterion	UN Manual of Tests and Criteria Rev5, Part Ⅲ, sub-section 38.3		

试验名称/Test Name		T1:高度模拟试验 Altitude Simulation			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.32	4.295	99.5	N
2		4.321	4.298	99.5	N
3		4.319	4.299	99.5	N
4		4.312	4.306	99.9	N
5		4.316	4.308	99.8	N
6		4.319	4.312	99.8	N
7		4.309	4.302	99.8	N
8		4.315	4.310	99.9	N
9		4.313	4.309	99.9	N
10		4.312	4.308	99.9	N

试验名称/Test Name		T2:温度试验 Thermal			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.295	4.245	98.8	N
2		4.298	4.248	98.8	N
3		4.299	4.245	98.7	N
4		4.306	4.244	98.6	N
5		4.308	4.235	98.3	N
6		4.312	4.251	98.6	N
7		4.302	4.230	98.3	N
8		4.310	4.248	98.6	N
9		4.309	4.250	98.6	N
10		4.308	4.248	98.6	N

试验名称/Test Name		T3:振动试验 Vibration			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.245	4.241	99.9	N
2		4.248	4.243	99.9	N
3		4.245	4.242	99.9	N
4		4.244	4.243	100.0	N
5		4.235	4.231	99.9	N
6		4.251	4.244	99.8	N
7		4.230	4.228	100.0	N
8		4.248	4.245	99.9	N
9		4.250	4.243	99.8	N
10		4.248	4.244	99.9	N

现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 排气:V <Venting> 渗漏:L <Leakage> 无异常:N <No rupture, No fire, No disassembly, No venting, No leakage>

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国联劝告试验 结果 2
Test Result of UN Recommendations Part 2

试验名称/Test Name	T4:冲击试验 Shock			
番号 No.	电池状态 Conditions	试验前/Before OCV (V)	试验后/After OCV (V)	OCV维持率/ Residual OCV (90%以上)	现象确认/ Occurrence
1	初回满充电/ First cycle, fully charged	4.241	4.240	100.0	N
2		4.243	4.243	100.0	N
3		4.242	4.242	100.0	N
4		4.243	4.242	100.0	N
5		4.231	4.231	100.0	N
6		4.244	4.243	100.0	N
7		4.228	4.228	100.0	N
8		4.245	4.244	100.0	N
9		4.243	4.243	100.0	N
10		4.244	4.244	100.0	N
现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 排气:V <Venting> 渗漏:L <Leakage> 无异常:N <No rupture, No fire, No disassembly, No venting, No leakage>				

试验名称/Test Name	T5:外短路试验 External Short Circuit					
番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence	番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence
1	初回满充电/ First cycle, fully charged	55.7℃	N	6	初回满充电/ First cycle, fully charged	55.6℃	N
2		55.3℃	N	7		55.3℃	N
3		55.3℃	N	8		55.3℃	N
4		55.3℃	N	9		55.3℃	N
5		55.3℃	N	10		55.3℃	N
现象/Occurrence	破裂:R <Rupture> 起火:F <Fire> 解体:D <Disassembly> 无异常:N <No rupture, No fire, No disassembly>						

试验名称/Test Name	T6: 撞击(impact)/挤压(crush) 试验		
番号 No.	电池状态 Conditions	最大表面温度/Max. Surface Temperature (℃) 170℃	现象确认/Occurrence
1	初回 50%充电 (宽面)/ First cycle, 50% charged (wide surface)	<160℃	N
2		<160℃	N
3		<160℃	N
4		<160℃	N
5		<160℃	N
现象/Occurrence	解体: D <Disassembly> 起火: F <Fire> 无异常: N <No fire, No disassembly>		

试验名称/Test Name	T7:过充电试验 Overcharge			
番号 No.	电池状态 Conditions	现象确认/Occurrence	番号 No.	电池状态 Conditions	现象确认/Occurrence
1	初回满充电/ First cycle, fully charged	N	5	50次循环后 满充电/ After 50 cycles, fully charged	N
2		N	6		N
3		N	7		N
4		N	8		N
现象/Occurrence	起火:F <Fire> 解体:D <Disassembly> 无异常:N <No fire, No disassembly>				

* Temperature Measurement by Thermolabel

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国联劝告试验 结果 3

Test Result of UN Recommendations Part 3

试验名称 /Test Name	T8: 强制放电 Forced Discharge				
番号 N	电池状态 Conditions	现象确认 /Occurrence	番号 N	电池状态 Conditions	现象确认 /Occurrence
1	初次循环 完全放电 / First cycle, fully discharged	N	11	50次循环后 完全放电 / After 50 cycles, fully discharged	N
2		N	12		N
3		N	13		N
4		N	14		N
5		N	15		N
6		N	16		N
7		N	17		N
8		N	18		N
9		N	19		N
10		N	20		N
现象 / Occurrence	起火:F <Fire> 解体:D <Disassembly> 无异常:N <No fire, No disassembly>				

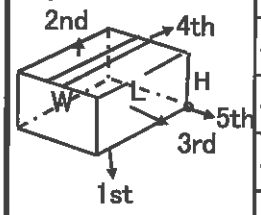
秘 CONFIDENTIAL

国連勧告試験 梱包結果
Test Result of UN Recommendations for Package

試験場所/ Test Company	索尼电子(无锡)有限公司				
住所/ Address	中国江苏省无锡市新区长江路27号			電話/ Tel	86-18068308951
試験室/ Test Room	SEW国联劝告试验室	試験期間/ Test Dates	2013.11.11-2013.11.14	試験番号 /Test N	SEW-CB13198
機種名/ Sony Model Name	LIS1544MRPC		梱包入り数 /Quantity		160 pcs
使用セル/ Cell Model Name	US405074H2	構成/ Configuration	1P1S	梱包製造所/ Package Factor	SEW
包装等級 / Packing Group	等級Ⅱ /Packing Group Number Ⅱ				

寸法・質量 / Dimensions and Gross Weight	長辺/Length(L)	短辺 /Wide (W)	高さ/Height (H)	質量 /Gross Weight (kg)
	400 mm	300 mm	160 mm	9.0 kg

■ 落下試験/Drop Test

試験設備	HORAD PD-315			
試験条件/ Test condition	落下高さ /Drop height	1．2m	試験結果 /Occurrence	
落下姿勢(方向)/ Five (one for each drop) 	1回目の落下試験	底面を水平に/ flat on the bottom	著しい破損なし/No Leakage, No damege liable to affect safety during	
	2回目の落下試験	天面を水平に / flat on the top	著しい破損なし/No Leakage, No damege liable to affect safety during	
	3回目の落下試験	長側面を水平に/ flat on the long side	著しい破損なし/No Leakage, No damege liable to affect safety during	
	4回目の落下試験	短側面を水平に/ flat on the short side	著しい破損なし/No Leakage, No damege liable to affect safety during	
	5回目の落下試験	コーナー(角)※/ on a corner	著しい破損なし/No Leakage, No damege liable to affect safety during	
	※コーナー:容器が最も破損を受ける方向を選択			
判定基準/ Criterion	外装容器及び袋の場合、外装容器の最も外側の層に輸送中の安全を脅かすようないかなる破損が生じてはならない。		判定/ Judgment	合格/OK

■ 積み重ね試験/Stacking Test

試験条件/Test condition	No	試験結果 /Occurrence
試験荷重値/Weight Load 165 kg	1	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
	2	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
	3	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration

判定基準/ Criterion	試供品は漏洩があってはならない。試供品は、輸送の安全性を損なうような劣化、又はその強度を減じたり、又は輸送物の積重ねを不安定にするような歪みが生じてはならない。	判定/ Judgment	合格/OK

Weiwei Tang

WeiWei Tang / Senior Manager
Quality Assurance Department
Sony Electronics (Wuxi) Co., Ltd.

品保-P检-022(3)

総合判定
合格/OK

문서번호	QAE-EF02-131223-PKEL40	
Prepared	김홍일	
	남익현	
Reviewed	남대호	
	우민제	
Approved	김병수	

SolutionPartner

UN Test Report
- EL40(Min.7.1Wh, 3.8V)-

목 차

1. UN Transportation Regulation Test
2. Test Procedure
3-1. T1~T4 Test Result
3-2. T5 / T7 Test Result
3-3. T6 / T8 Test Result
4. Sample Image

2013. 12. 23

LG Chem

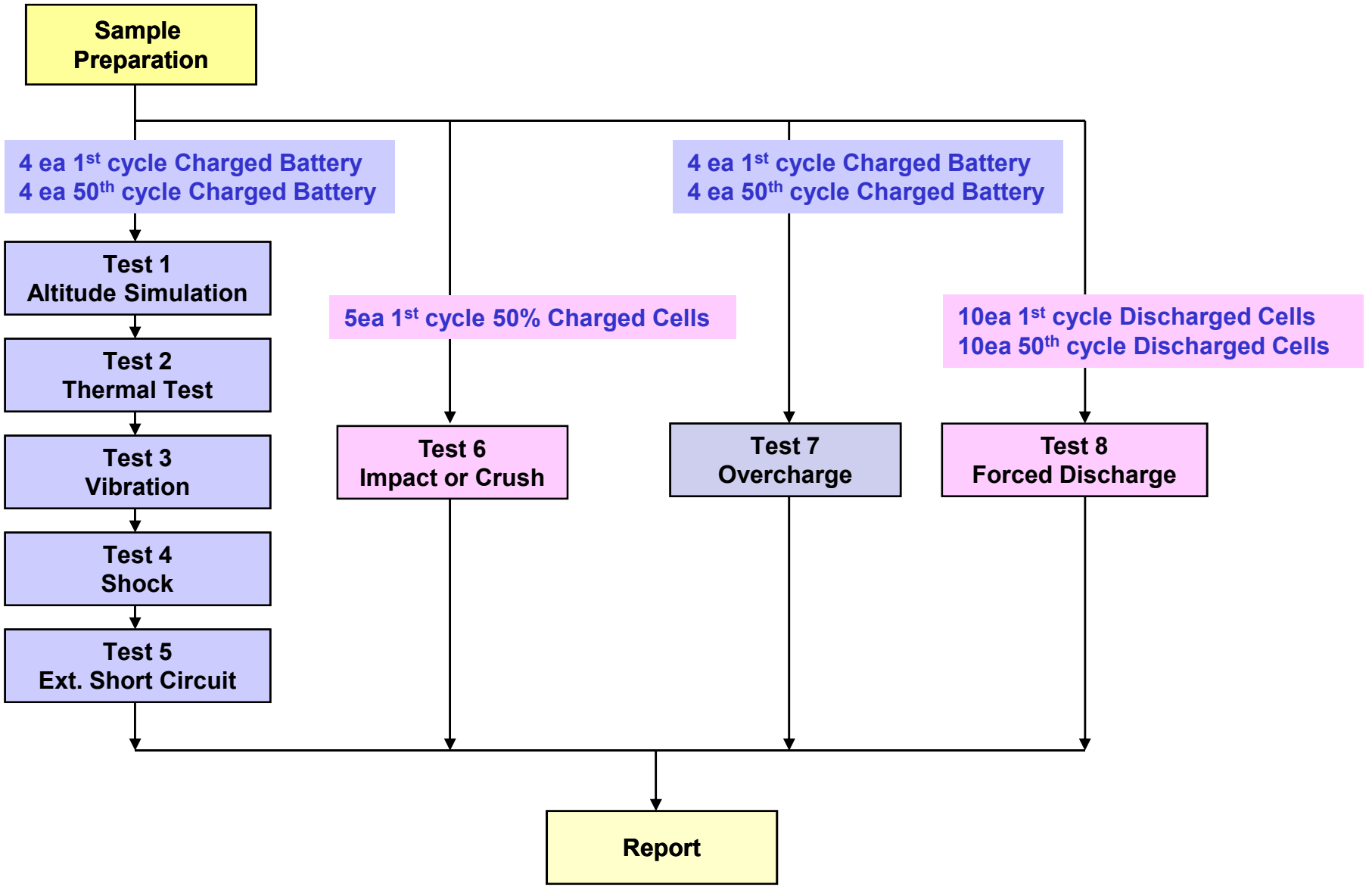
1. UN Transportation Regulation Test

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 (> 20mm 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 (≤ 20mm 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 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/Amd.1)

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	32.279	4.319	32.278	99.93	0.003	Pass	4.259	32.278	98.61	0.000	Pass	4.258	32.277	99.98	0.003	Pass	4.256	32.277	99.95	0.000	Pass
	2	4.322	32.311	4.320	32.311	99.95	0.000	Pass	4.259	32.310	98.59	0.003	Pass	4.257	32.309	99.95	0.003	Pass	4.255	32.308	99.95	0.003	Pass
	3	4.321	32.299	4.318	32.298	99.93	0.003	Pass	4.256	32.298	98.56	0.000	Pass	4.255	32.297	99.98	0.003	Pass	4.253	32.296	99.95	0.003	Pass
	4	4.322	32.316	4.318	32.316	99.91	0.000	Pass	4.255	32.315	98.54	0.003	Pass	4.253	32.315	99.95	0.000	Pass	4.251	32.315	99.95	0.000	Pass
	Ave.	4.322	32.301	4.319	32.301	99.93	0.002	-	4.257	32.300	98.58	0.002	-	4.256	32.300	99.96	0.002	-	4.254	32.299	99.95	0.002	-
B. 50th cycle fully state																							
Charge	5	4.313	32.277	4.311	32.276	99.95	0.003	Pass	4.265	32.276	98.93	0.000	Pass	4.263	32.275	99.95	0.003	Pass	4.262	32.274	99.98	0.003	Pass
	6	4.314	32.289	4.311	32.288	99.93	0.003	Pass	4.261	32.287	98.84	0.003	Pass	4.259	32.286	99.95	0.003	Pass	4.257	32.286	99.95	0.000	Pass
	7	4.313	32.309	4.312	32.308	99.98	0.003	Pass	4.258	32.308	98.75	0.000	Pass	4.255	32.307	99.93	0.003	Pass	4.253	32.306	99.95	0.003	Pass
	8	4.312	32.298	4.31	32.298	99.95	0.000	Pass	4.254	32.298	98.70	0.000	Pass	4.251	32.298	99.93	0.000	Pass	4.249	32.297	99.95	0.003	Pass
	Ave.	4.313	32.293	4.311	32.293	99.95	0.002	-	4.260	32.292	98.81	0.001	-	4.257	32.292	99.94	0.002	-	4.255	32.291	99.96	0.002	-

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)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	1	4.256	55.78	Pass
	2	4.255	55.49	Pass
	3	4.253	54.45	Pass
	4	4.251	54.88	Pass
	MAX.	4.256	55.88	-

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

EXT.Short Circuit (T5)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	5	4.262	55.76	Pass
	6	4.257	55.29	Pass
	7	4.253	55.68	Pass
	8	4.249	56.21	Pass
	MAX.	4.262	56.21	-

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

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 : 1920mA - CC/CV 2Imax(3840mA) 8.7V cut-off 24Hr

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 after the test

3-3. T6/T8 Test Result (ICP394973L1)

Crush (T6)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state				
Direction				
Flat	1	3.647	23.50	Pass
	2	3.647	23.45	Pass
	3	3.648	24.10	Pass
	4	3.647	24.08	Pass
	5	3.648	24.10	Pass
MAX.		3.678	24.10	-

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)			
Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully Discharged state			
1	3.316	83.11	Pass
2	3.321	82.92	Pass
3	3.319	79.88	Pass
4	3.317	80.27	Pass
5	3.324	79.33	Pass
6	3.319	83.05	Pass
7	3.318	81.22	Pass
8	3.321	78.65	Pass
9	3.317	78.25	Pass
10	3.315	79.14	Pass
MAX.	3.324	83.11	-
B. 50th cycle fully discharged state			
1	3.453	85.97	Pass
2	3.451	87.99	Pass
3	3.461	88.61	Pass
4	3.448	89.91	Pass
5	3.453	85.31	Pass
6	3.453	90.03	Pass
7	3.450	86.59	Pass
8	3.499	87.86	Pass
9	3.487	88.56	Pass
10	3.455	89.53	Pass
MAX.	3.487	90.03	-

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

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

4. Sample Image

문서번호	QAE-EF02-131223-PKEL40	
Prepared	김홍일	
	남익현	
Reviewed	남대호	
	우민제	
Approved	김병수	

SolutionPartner

UN Test Report
- EL40(Min.7.1Wh, 3.8V)-

목 차

1. UN Transportation Regulation Test
2. Test Procedure
3-1. T1~T4 Test Result
3-2. T5 / T7 Test Result
3-3. T6 / T8 Test Result
4. Sample Image

2013. 12. 23

LG Chem

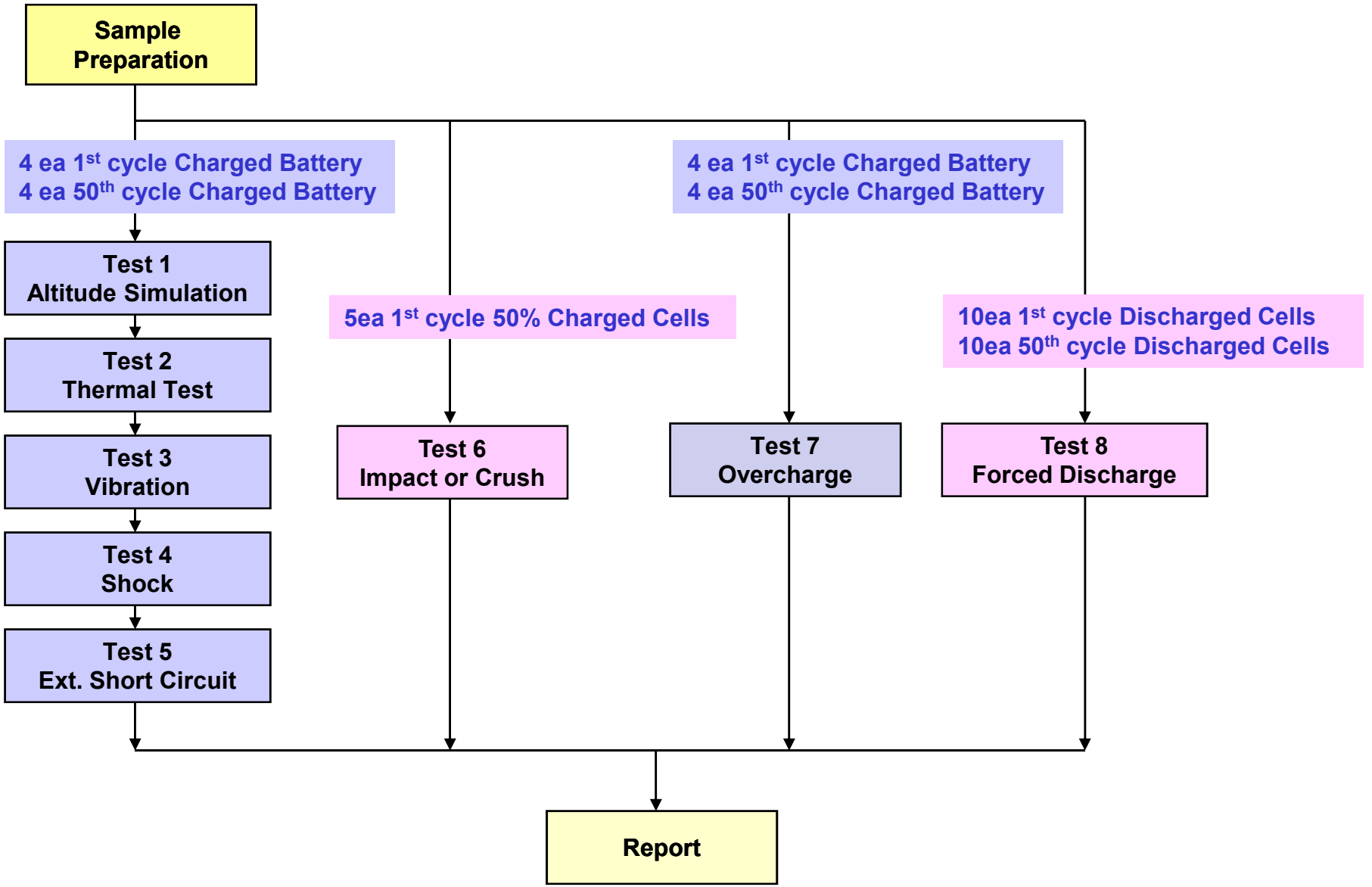
1. UN Transportation Regulation Test

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 (> 20mm 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 (≤ 20mm 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 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/Amd.1)

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	32.279	4.319	32.278	99.93	0.003	Pass	4.259	32.278	98.61	0.000	Pass	4.258	32.277	99.98	0.003	Pass	4.256	32.277	99.95	0.000	Pass
	2	4.322	32.311	4.320	32.311	99.95	0.000	Pass	4.259	32.310	98.59	0.003	Pass	4.257	32.309	99.95	0.003	Pass	4.255	32.308	99.95	0.003	Pass
	3	4.321	32.299	4.318	32.298	99.93	0.003	Pass	4.256	32.298	98.56	0.000	Pass	4.255	32.297	99.98	0.003	Pass	4.253	32.296	99.95	0.003	Pass
	4	4.322	32.316	4.318	32.316	99.91	0.000	Pass	4.255	32.315	98.54	0.003	Pass	4.253	32.315	99.95	0.000	Pass	4.251	32.315	99.95	0.000	Pass
	Ave.	4.322	32.301	4.319	32.301	99.93	0.002	-	4.257	32.300	98.58	0.002	-	4.256	32.300	99.96	0.002	-	4.254	32.299	99.95	0.002	-
B. 50th cycle fully state																							
Charge	5	4.313	32.277	4.311	32.276	99.95	0.003	Pass	4.265	32.276	98.93	0.000	Pass	4.263	32.275	99.95	0.003	Pass	4.262	32.274	99.98	0.003	Pass
	6	4.314	32.289	4.311	32.288	99.93	0.003	Pass	4.261	32.287	98.84	0.003	Pass	4.259	32.286	99.95	0.003	Pass	4.257	32.286	99.95	0.000	Pass
	7	4.313	32.309	4.312	32.308	99.98	0.003	Pass	4.258	32.308	98.75	0.000	Pass	4.255	32.307	99.93	0.003	Pass	4.253	32.306	99.95	0.003	Pass
	8	4.312	32.298	4.31	32.298	99.95	0.000	Pass	4.254	32.298	98.70	0.000	Pass	4.251	32.298	99.93	0.000	Pass	4.249	32.297	99.95	0.003	Pass
	Ave.	4.313	32.293	4.311	32.293	99.95	0.002	-	4.260	32.292	98.81	0.001	-	4.257	32.292	99.94	0.002	-	4.255	32.291	99.96	0.002	-

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)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	1	4.256	55.78	Pass
	2	4.255	55.49	Pass
	3	4.253	54.45	Pass
	4	4.251	54.88	Pass
	MAX.	4.256	55.88	-

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

EXT.Short Circuit (T5)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	5	4.262	55.76	Pass
	6	4.257	55.29	Pass
	7	4.253	55.68	Pass
	8	4.249	56.21	Pass
	MAX.	4.262	56.21	-

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

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 : 1920mA - CC/CV 2Imax(3840mA) 8.7V cut-off 24Hr

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 after the test

3-3. T6/T8 Test Result (ICP394973L1)

Crush (T6)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state				
Direction				
Flat	1	3.647	23.50	Pass
	2	3.647	23.45	Pass
	3	3.648	24.10	Pass
	4	3.647	24.08	Pass
	5	3.648	24.10	Pass
MAX.		3.678	24.10	-

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)			
Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully Discharged state			
1	3.316	83.11	Pass
2	3.321	82.92	Pass
3	3.319	79.88	Pass
4	3.317	80.27	Pass
5	3.324	79.33	Pass
6	3.319	83.05	Pass
7	3.318	81.22	Pass
8	3.321	78.65	Pass
9	3.317	78.25	Pass
10	3.315	79.14	Pass
MAX.	3.324	83.11	-
B. 50th cycle fully discharged state			
1	3.453	85.97	Pass
2	3.451	87.99	Pass
3	3.461	88.61	Pass
4	3.448	89.91	Pass
5	3.453	85.31	Pass
6	3.453	90.03	Pass
7	3.450	86.59	Pass
8	3.499	87.86	Pass
9	3.487	88.56	Pass
10	3.455	89.53	Pass
MAX.	3.487	90.03	-

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

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

4. Sample Image

문서번호	QAE-EF02-131223-PKEL40	
Prepared	김홍일	
	남익현	
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SolutionPartner

UN Test Report
- EL40(Min.7.1Wh, 3.8V)-

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2013. 12. 23

LG Chem

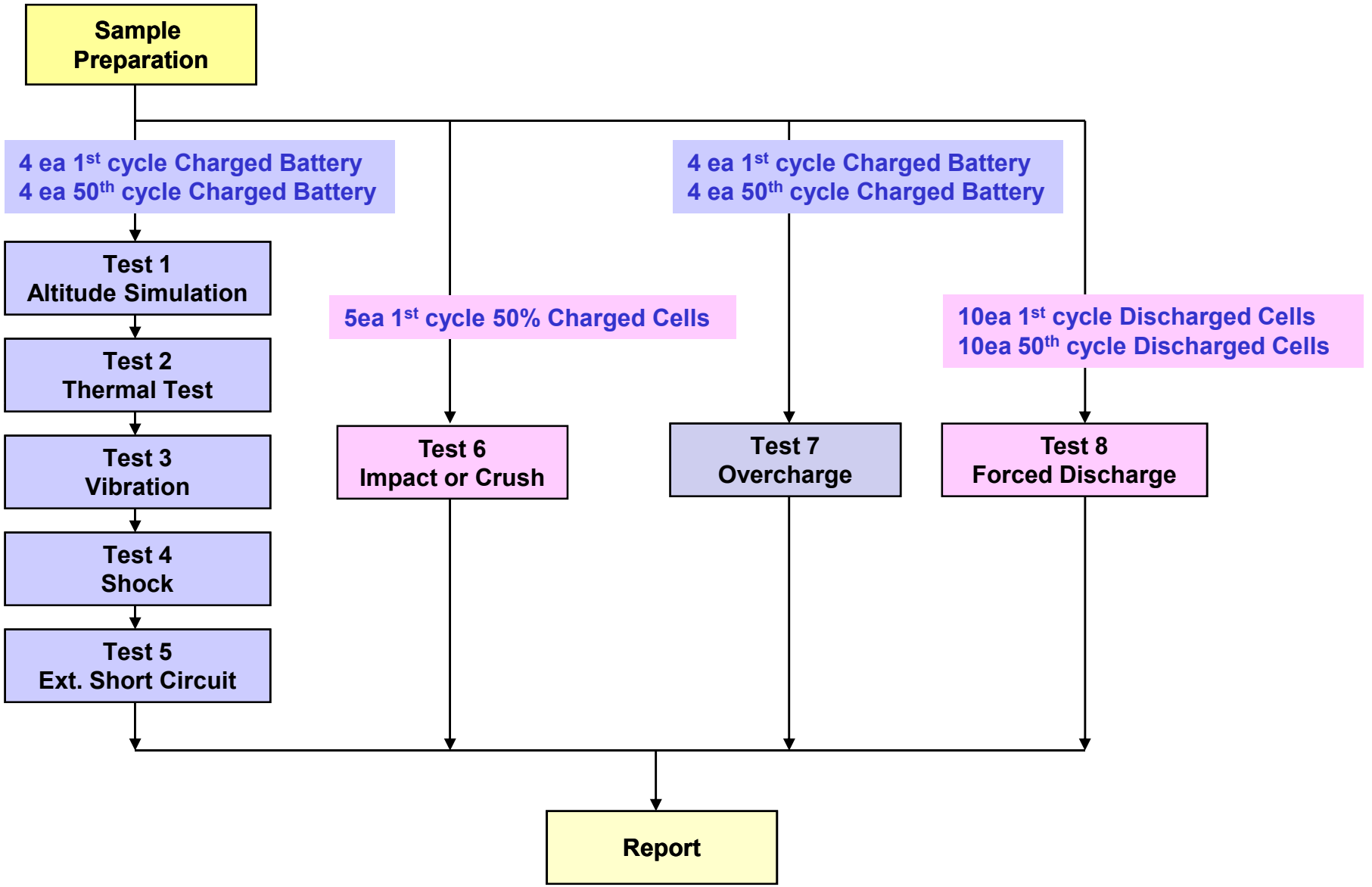
1. UN Transportation Regulation Test

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 (> 20mm 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 (≤ 20mm 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 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/Amd.1)

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	32.279	4.319	32.278	99.93	0.003	Pass	4.259	32.278	98.61	0.000	Pass	4.258	32.277	99.98	0.003	Pass	4.256	32.277	99.95	0.000	Pass
	2	4.322	32.311	4.320	32.311	99.95	0.000	Pass	4.259	32.310	98.59	0.003	Pass	4.257	32.309	99.95	0.003	Pass	4.255	32.308	99.95	0.003	Pass
	3	4.321	32.299	4.318	32.298	99.93	0.003	Pass	4.256	32.298	98.56	0.000	Pass	4.255	32.297	99.98	0.003	Pass	4.253	32.296	99.95	0.003	Pass
	4	4.322	32.316	4.318	32.316	99.91	0.000	Pass	4.255	32.315	98.54	0.003	Pass	4.253	32.315	99.95	0.000	Pass	4.251	32.315	99.95	0.000	Pass
	Ave.	4.322	32.301	4.319	32.301	99.93	0.002	-	4.257	32.300	98.58	0.002	-	4.256	32.300	99.96	0.002	-	4.254	32.299	99.95	0.002	-
B. 50th cycle fully state																							
Charge	5	4.313	32.277	4.311	32.276	99.95	0.003	Pass	4.265	32.276	98.93	0.000	Pass	4.263	32.275	99.95	0.003	Pass	4.262	32.274	99.98	0.003	Pass
	6	4.314	32.289	4.311	32.288	99.93	0.003	Pass	4.261	32.287	98.84	0.003	Pass	4.259	32.286	99.95	0.003	Pass	4.257	32.286	99.95	0.000	Pass
	7	4.313	32.309	4.312	32.308	99.98	0.003	Pass	4.258	32.308	98.75	0.000	Pass	4.255	32.307	99.93	0.003	Pass	4.253	32.306	99.95	0.003	Pass
	8	4.312	32.298	4.31	32.298	99.95	0.000	Pass	4.254	32.298	98.70	0.000	Pass	4.251	32.298	99.93	0.000	Pass	4.249	32.297	99.95	0.003	Pass
	Ave.	4.313	32.293	4.311	32.293	99.95	0.002	-	4.260	32.292	98.81	0.001	-	4.257	32.292	99.94	0.002	-	4.255	32.291	99.96	0.002	-

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)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully state				
Charge	1	4.256	55.78	Pass
	2	4.255	55.49	Pass
	3	4.253	54.45	Pass
	4	4.251	54.88	Pass
	MAX.	4.256	55.88	-

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

EXT.Short Circuit (T5)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
B. 50th cycle fully state				
Charge	5	4.262	55.76	Pass
	6	4.257	55.29	Pass
	7	4.253	55.68	Pass
	8	4.249	56.21	Pass
	MAX.	4.262	56.21	-

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

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 : 1920mA - CC/CV 2Imax(3840mA) 8.7V cut-off 24Hr

Over Charge (T7)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	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 after the test

3-3. T6/T8 Test Result (ICP394973L1)

Crush (T6)				
	Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle 50% charged state				
Direction				
Flat	1	3.647	23.50	Pass
	2	3.647	23.45	Pass
	3	3.648	24.10	Pass
	4	3.647	24.08	Pass
	5	3.648	24.10	Pass
MAX.		3.678	24.10	-

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)			
Pack NO.	Initial OCV(V)	Max. Temp (℃)	Result
A. 1st cycle fully Discharged state			
1	3.316	83.11	Pass
2	3.321	82.92	Pass
3	3.319	79.88	Pass
4	3.317	80.27	Pass
5	3.324	79.33	Pass
6	3.319	83.05	Pass
7	3.318	81.22	Pass
8	3.321	78.65	Pass
9	3.317	78.25	Pass
10	3.315	79.14	Pass
MAX.	3.324	83.11	-
B. 50th cycle fully discharged state			
1	3.453	85.97	Pass
2	3.451	87.99	Pass
3	3.461	88.61	Pass
4	3.448	89.91	Pass
5	3.453	85.31	Pass
6	3.453	90.03	Pass
7	3.450	86.59	Pass
8	3.499	87.86	Pass
9	3.487	88.56	Pass
10	3.455	89.53	Pass
MAX.	3.487	90.03	-

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

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

4. Sample Image