

TEST REPORT OF CLASSIFICATION FOR DANGEROUS GOODS – LITHIUM METAL AND LITHIUM ION BATTERIES

New Application Modification Other:

Report ID: 2018116J19733

Sample Name: Lithium-ion Battery

Model/Type: Storion-SMILE-B3
51.2V56Ah/2850Wh

Applicant: Alpha ESS Co., Ltd.



CQC Intime Testing Technology Co.,Ltd

TEST REPORT

Report ID: 2018116J19733

Test Unit: CQC Intime Testing Technology Co., Ltd

Address: East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.

Postal code: 215104 **Phone:** 0512-66303623 **Fax:** 0512-66303625

Testing location/procedure: East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.

Applicant's name: Alpha ESS Co., Ltd.

Address: JiuHua Road 888, Nantong High-Tech Industrial Development Zone, Nantong City

Sample Name: Lithium-ion Battery **Trade Mark:** Alpha-ESS

Model/Type: Storion-SMILE-B3 **Ratings:** 51.2V56Ah/2850Wh

Manufacturer: Alpha ESS Co., Ltd.

Address: JiuHua Road 888, Nantong High-Tech Industrial Development Zone, Nantong City

Standard Specification: UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, ST/SG/AC.10/11/, sub-section 38.3. Rev.6

Test Procedure: — **Non-standard Test Method:** —

Test Item: Altitude Simulation, Thermal Test, Vibration, Shock, External Short Circuit, Impact, Overcharge, Force Discharge

Date of receipt of test item: 2018.11.30

Finished Date: 2018.12.27

Conclusion: The Submitted Sample(s) Meet the Requirement of the Standard.

Testing Conditions: Temperature: 21.0°C ~ 25.2°C Relative Humidity: 53.7%~65.5%

Engineer: Liu Rong Signature: Date: 2018.12.27

Auditor: Cao Wei Signature: Date: 2018.12.27

Approver: Zhao Runsheng Signature: Date: 2018.12.27

Seal of CQC IT

Date of issue:

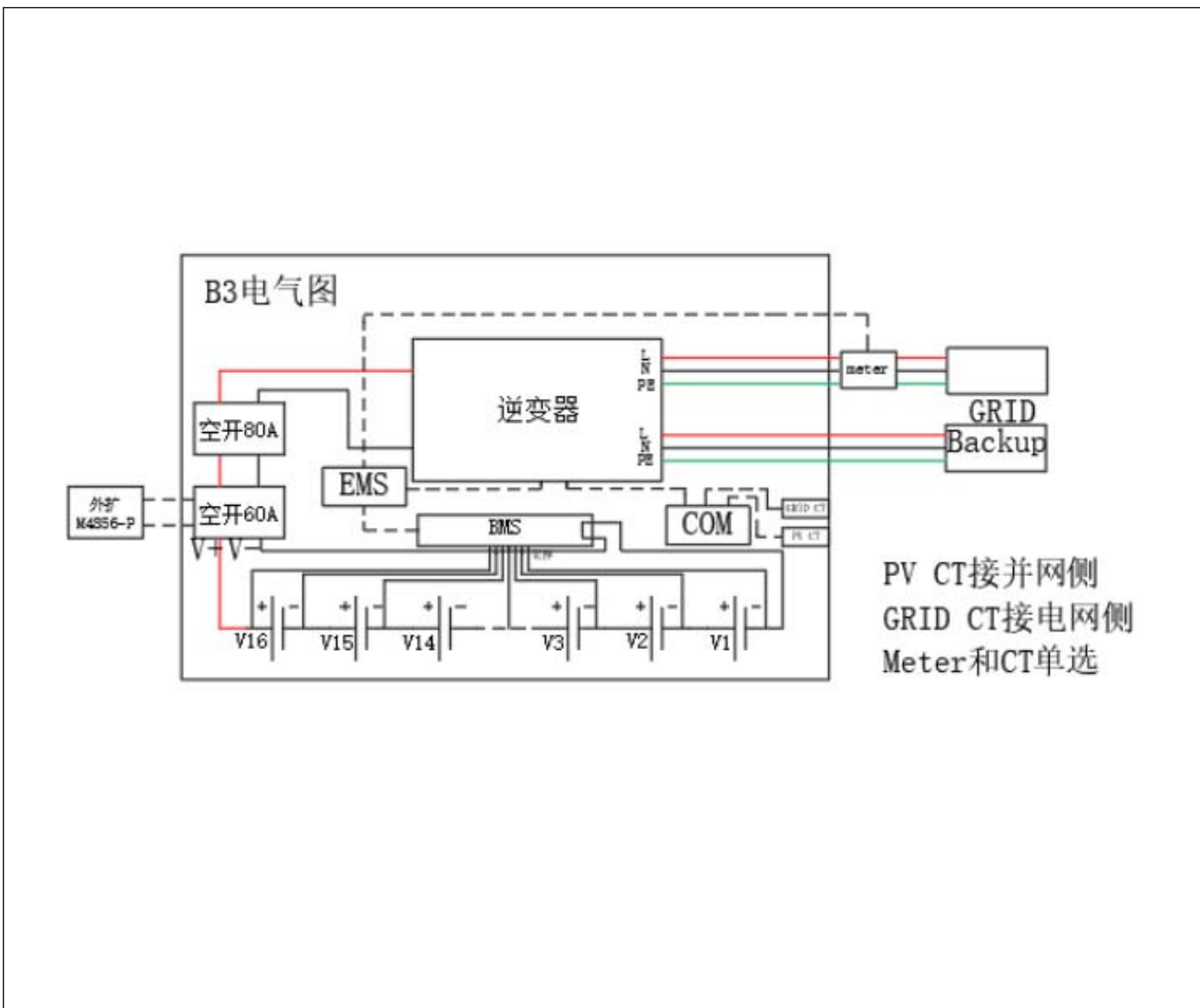
2018.12.27

Remark: (1) P: Test object does meet the requirement. (2) F: Test object does not meet the requirement.
(3) N/A: Test case does not apply to the test object. (4) ---: Test case does not conduct

The Table of Battery Fundamental Parameters

Item	Rated Performance	Item	Rated Performance
Nominal capacity (Ah)	56	Nominal voltage(V)	51.2
Rated power(Wh)	2850	Limited charge voltage(V)	57.6
Charge current(A)	56	Maximum continuous charging current (A)	56
End charge current(mA)	56	Discharge current(A)	56
Cut-off voltage (V)	48	Cell numbers	16
Maximum discharge current(A)	56	Type of cell(mm)	square
Permutation of cell	16S1P	Capacity of cell(Ah)	56
--	--	--	--
--	--	--	--

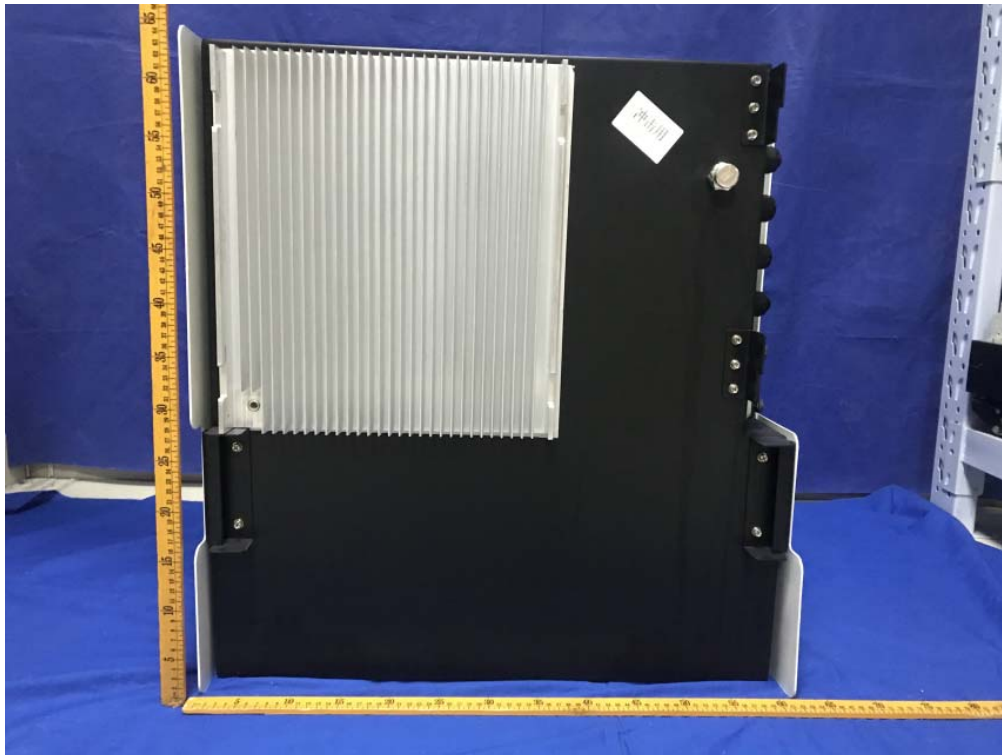
The Battery Electrical Connection Diagram



Sample photograph-1



Sample photograph-2



Sample photograph-3



Sample photograph-4




Sample photograph-5



Sample photograph-6




Sample photograph-7



Energy Storage System
Model: Storion-SMILE-B3

Battery Type	Lithium-Ion
Battery Rated Voltage	51.2 Vd.c
Max. Charging Current	60 Ad.c
Max. Discharging Current	60 Ad.c
Rated Grid / Backup Voltage	230 Va.c
Rated Grid / Backup Frequency	50/60 Hz
Rated Grid / Backup Current	13.1 Aa.c
Rated Grid / Backup Power	3000 W / 3000 VA
Power Factor Range	0.8 cap~0.8 ind
IP Degree	IP65
Inverter Topology	Isolated
Operating Temperature Range	-10~50 °C
AC Overvoltage Category	III
DC Overvoltage Category	II
Protective Class	Class I



Alpha ESS Co., Ltd.
 TEL: +86 (0) 513 806 068 91 EMAIL: info@alpha-ess.com
 ADD: JiuHua Road 888, Nantong High-Tech Industrial
 Development Zone, Nantong City, 226300

DRM 0	<input checked="" type="checkbox"/>	DRM 1	<input type="checkbox"/>	DRM 2	<input type="checkbox"/>
DRM 3	<input type="checkbox"/>	DRM 4	<input type="checkbox"/>	DRM 5	<input type="checkbox"/>
DRM 6	<input type="checkbox"/>	DRM 7	<input type="checkbox"/>	DRM 8	<input type="checkbox"/>

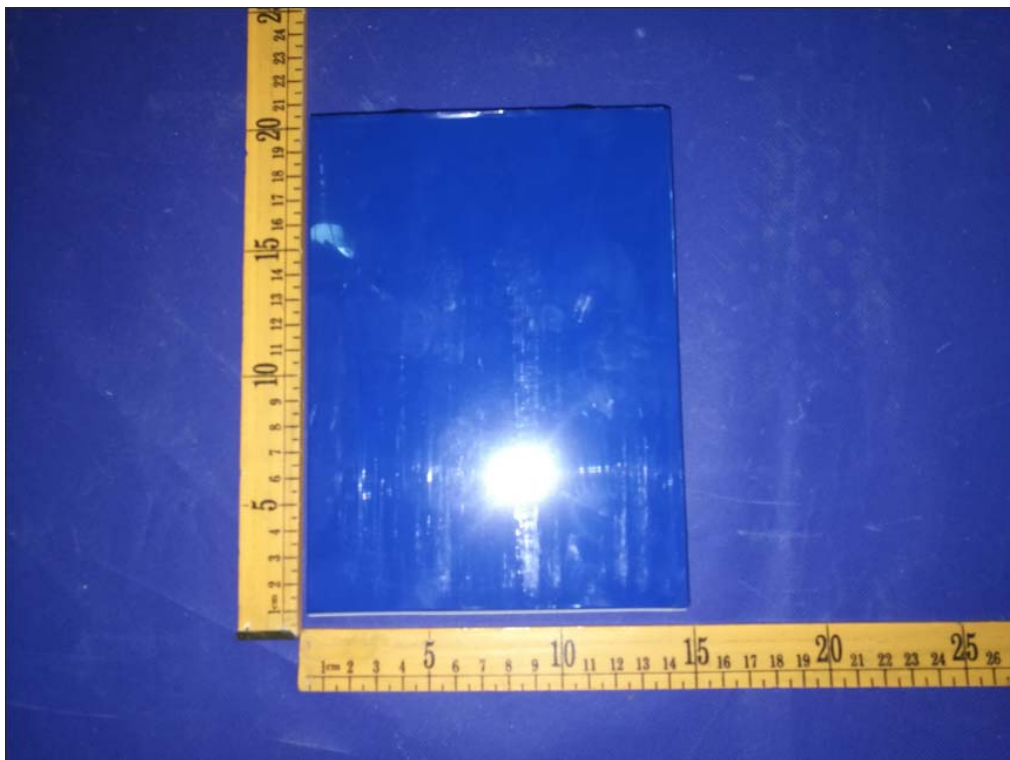
Sample photograph-8



Sample photograph-9



Sample photograph-10



CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.1 Altitude simulation	<p>Battery at first cycle in fully charged state.</p> <p>Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ($20 \pm 5^\circ\text{C}$).</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group1 Group2	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss. Test data is shown in Annex 1.</p>	P
	<p>Battery after 25 cycles in fully charged state.</p> <p>Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ($20 \pm 5^\circ\text{C}$).</p>		/	Group3 Group4		P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.2 Thermal test	Battery at first cycle in fully charged state. Test batteries are to be stored for at least 12 hours at a test temperature equal to $75\pm 2^{\circ}\text{C}$, followed by storage for at least 12 hours at a test temperature equal to $-40\pm 2^{\circ}\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature ($20\pm 5^{\circ}\text{C}$).	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage.	/	Group1 Group2	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage.	P
	Battery after 25 cycles in fully charged state. Test batteries are to be stored for at least 12 hours at a test temperature equal to $75\pm 2^{\circ}\text{C}$, followed by storage for at least 12 hours at a test temperature equal to $-40\pm 2^{\circ}\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature ($20\pm 5^{\circ}\text{C}$).	Mass loss limit 0.1%.	/	Group3 Group4	No mass loss. Test data is shown in Annex 2.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	<p>Battery at first cycle in fully charged state.</p> <p>Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 g_n occurs (approximately 25 Hz). A peak acceleration of 2 g_n is then maintained until the frequency is increased to 200 Hz.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group1 Group2	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss. Test data is shown in Annex 3.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	<p>Battery after 25 cycles in fully charged state.</p> <p>Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 g_n occurs (approximately 25 Hz). A peak acceleration of 2 g_n is then maintained until the frequency is increased to 200 Hz.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group3 Group4	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss . Test data is shown in Annex 3.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	<p>Battery at first cycle in fully charged state.</p> <p>Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.</p> <p>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g n (or Acceleration(g n) = $\sqrt{\frac{100850}{\text{mass}}}$), which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50 g n (or Acceleration(g n) = $\sqrt{\frac{30000}{\text{THREE}}}$), which is smaller) and pulse duration of Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group1 Group2	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	<p>Battery after 25 cycles in fully charged state.</p> <p>Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.</p> <p>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g n (or Acceleration(g n)= $\sqrt{\left(\frac{100850}{\text{mass}}\right)}$, which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50 g n (or Acceleration(g n)= $\sqrt{\left(\frac{30000}{\text{mass}}\right)}$, which is smaller) and pulse duration of Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group3 Group4	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	<p>Battery at first cycle in fully charged state.</p> <p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $57\pm 4^{\circ}\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $57\pm 4^{\circ}\text{C}$. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm 4^{\circ}\text{C}$. The battery must be observed for a further six hours for the test to be concluded.</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire</p>	/	Group1 Group2	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire Test data is shown in Annex 5.</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	<p>Battery after 25 cycles in fully charged state.</p> <p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $57\pm 4^{\circ}\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $57\pm 4^{\circ}\text{C}$. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm 4^{\circ}\text{C}$. The battery must be observed for a further six hours for the test to be concluded.</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire</p>	/	Group3 Group4	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire Test data is shown in Annex 5.</p>	P

CQC Intime Testing Technology Co., Ltd TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.6 Crush	<p>Cell at first cycle at 50% of the design rated capacity.</p> <p>A cell or component cell is to be crushed between two flat surfaces. The crushing is to Be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.</p> <p>(a) The applied force reaches 13 kN ± 0.78 kN; (b) The voltage of the cell drops by at least 100 mV; or (c) The cell is deformed by 50% or more of its original thickness. Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released. A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.</p>	<p>External temperature does not exceed 170°C. No disassembly No fire</p>	/	1 # 2 # 3 # 4 # 5 #	<p>External temperature does not exceed 170°C. No disassembly No fire Test data is shown in Annex 6.</p>	P

*: Component Cells Of Battery.

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	<p>Battery at first cycle in fully discharged state.</p> <p>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:</p> <p>(a) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.</p> <p>(b) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.</p> <p>Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.</p>	<p>No disassembly No fire</p>	/	Group5 Group6	<p>No disassembly No fire Test data is shown in Annex 7</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	<p>Battery after 25 cycles in fully charged state.</p> <p>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:</p> <p>(c) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.</p> <p>(d) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.</p> <p>Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.</p>	<p>No disassembly No fire</p>	/	<p>Group7 Group8</p>	<p>No disassembly No fire Test data is shown in Annex 7</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	<p>Battery at first cycle in fully discharged state.</p> <p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.</p> <p>The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).</p> <p>The test sample shall be observed for a further 7 days.</p>	<p>No disassembly No fire</p>	/	6#-15#	<p>No disassembly No fire Test data is shown in Annex 8</p>	P

*: Component Cells Of Battery.

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	<p>Battery after 50 cycles in fully charged state.</p> <p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.</p> <p>The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).</p> <p>The test sample shall be observed for a further 7 days.</p>	No disassembly No fire	/	16#-25#	No disassembly No fire Test data is shown in Annex 8	P

*: **Component Cells Of Battery.**

CQC Intime Testing Technology Co., Ltd

TEST REPORT

List of Test Equipment

No	Test Equipment	Equipment Model	Equipment No	Expiry Date of Calibration	Remarks (√)
1	Low Pressure Chamber	315Z	ITCS1206013	2019-04-26	√
2	Thermal Shock Chambers	KWGDS61	ITCB16001	2019-04-16	√
3	Vibration Test System	DL-8000-80	ITCE11009	2019-04-12	√
4	Explosion proof impact test box	H-FZ-500	ITCEN07009	2019-04-05	√
5	High Temperature Explosion-proof Chamber	SPHH-101	ITCS06031	2019-04-18	√
6	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13010	2019-06-27	√
7	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13011	2019-04-18	√
8	Temperature Recorder	MV2020	ITCS111001	2019-04-05	√
9	Digital Multicenter	FLUKE177	ITCS06060-3	2019-04-18	√
10	Battery internal resistance tester	BT3563	ITCB14001	2019-08-19	√
11	Battery Impact Tester	H-FZ-500	ITCEN07009	2019-04-05	√
12	Battery charge and discharge detection equipment	CDS-5V100A-T	ITCB170205	2019-10-28	√
13	Battery charge and discharge detection equipment	CDS-5V100A-T	ITCB170209	2019-10-28	√
14	Electronic Scale	BCS-ACSC-30	ITCS11030	2019-08-26	√
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 1. Altitude Simulation

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ /OCV ₁ (%)	Mass Loss (M ₂ -M ₁)/M ₁ (%)	Remarks
Group 1	First cycle fully charged	53.52	50180	53.51	50180	99.98%	0.000%	--
Group 2	First cycle fully charged	53.51	50230	53.50	50230	99.98%	0.000%	--
Group 3	After 25 cycles fully charged	53.55	50190	53.54	50190	99.98%	0.000%	--
Group 4	After 25 cycles fully charged	53.54	50220	53.52	50220	99.96%	0.000%	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 2. Thermal Test

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ /OCV ₁ (%)	Mass Loss (M ₂ -M ₁)/M ₁ (%)	Remarks
Group 1	First cycle fully charged	53.51	50180	53.46	50170	99.91%	0.020%	--
Group 2	First cycle fully charged	53.50	50230	53.45	50220	99.91%	0.020%	--
Group 3	After 25 cycles fully charged	53.54	50190	53.50	50180	99.93%	0.020%	--
Group 4	After 25 cycles fully charged	53.52	50220	53.48	50220	99.93%	0.000%	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire

LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 3. Vibration

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ /OCV ₁ (%)	Mass Loss (M ₂ -M ₁)/M ₁ (%)	Remarks
Group 1	First cycle fully charged	53.46	50170	53.45	50170	99.98%	0.000%	--
Group 2	First cycle fully charged	53.45	50220	53.44	50220	99.98%	0.000%	--
Group 3	After 25 cycles fully charged	53.50	50180	53.50	50180	100.00%	0.000%	--
Group 4	After 25 cycles fully charged	53.48	50220	53.47	50220	99.98%	0.000%	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire

LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 4. Shock

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ /OCV ₁ (%)	Mass Loss (M ₂ -M ₁)/M ₁ (%)	Remarks
Group 1	First cycle fully charged	53.45	50170	53.44	50170	99.98%	0.000%	--
Group 2	First cycle fully charged	53.44	50220	53.44	50220	100.00%	0.000%	--
Group 3	After 25 cycles fully charged	53.50	50180	53.49	50180	99.98%	0.000%	--
Group 4	After 25 cycles fully charged	53.47	50220	53.47	50220	100.00%	0.000%	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Remarks:
NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 5. External Short Circuit

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
Group 1	First cycle fully charged	53.44	57.1	57.5	--
Group 2	First cycle fully charged	53.44	57.0	57.4	--
Group 3	After 25 cycles fully charged	53.49	57.0	57.6	--
Group 4	After 25 cycles fully charged	53.47	57.1	57.5	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire					

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 6. Crush

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
1	First cycle in 50% rated capacity	3.299	23.5	24.1	--
2	First cycle in 50% rated capacity	3.299	23.5	23.9	--
3	First cycle in 50% rated capacity	3.299	23.5	24.1	--
4	First cycle in 50% rated capacity	3.300	23.5	23.7	--
5	First cycle in 50% rated capacity	3.300	23.5	23.8	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire					

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 7. Overcharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
Group 5	First cycle fully charged	53.55	25.0	28.9	--
Group 6	First cycle fully charged	53.56	25.0	28.6	--
Group 7	After 25 cycles fully charged	53.54	25.0	29.5	--
Group 8	After 25 cycles fully charged	53.56	25.1	29.6	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire					

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
6 #	First cycle in fully charged	2.815	23.5	39.3	--
7#	First cycle in fully charged	2.818	23.5	38.2	--
8#	First cycle in fully charged	2.818	23.5	38.8	--
9#	First cycle in fully charged	2.814	23.5	37.7	--
10#	First cycle in fully charged	2.823	23.5	36.0	--
11#	First cycle in fully charged	2.821	23.5	37.7	--
12#	First cycle in fully charged	2.819	23.5	38.2	--
13#	First cycle in fully charged	2.821	23.5	34.4	--
14#	First cycle in fully charged	2.813	23.5	35.7	--
15#	First cycle in fully charged	2.813	23.5	36.0	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--

Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire

LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
16#	After 50 cycles in fully charged	2.817	23.5	40.5	--
17#	After 50 cycles in fully charged	2.817	23.5	41.7	--
18#	After 50 cycles in fully charged	2.818	23.5	42.0	--
19#	After 50 cycles in fully charged	2.819	23.5	39.5	--
20#	After 50 cycles in fully charged	2.820	23.5	39.2	--
21#	After 50 cycles in fully charged	2.820	23.5	42.3	--
22#	After 50 cycles in fully charged	2.817	23.5	38.2	--
23#	After 50 cycles in fully charged	2.814	23.5	37.1	--
24#	After 50 cycles in fully charged	2.815	23.5	25.3	--
25#	After 50 cycles in fully charged	2.820	23.5	28.5	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--

Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire

LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

Unless otherwise stated, All of the above tests were conducted at 20 ± 5 °C .

—End—

Statement

1. Don't copy the report partly, if you don't obtain the laboratory allows you to do that, unless you copy the whole report.
2. The test report is only valid to the samples which have been tested.
3. You can bring forward written appeal to the laboratory in ten days after you receive the report if you have objection to the test result.
4. The laboratory will deal with samples with itself if client don't take away samples in sixty days after client receive test report.

Test Unit: CQC Intime Testing Technology Co., Ltd

Headquarters Address: Wuzhong Scientific and Technology Park, No.1368
Wuzhong Dadao Road, Wuzhong Economic Development Zone, Suzhou, China.

Postal code: 215104

Phone: 0512-- 66303623

Fax: 0512—66303625

E-mail: cqc_jszlb@126.com

Xukou Laboratory: Caofeng Road No.236, Xukou Town, Suzhou

Cixi Office: Room 1020, Floor 10, North Tower, Central Building, 19 Shuinan
Road, Cixi Town, Zhejiang

Phone: 0574-63895313

Shenzhen Office: Floor 13A, Zhongyang Xigu Building, 139 Xinzhou 11th Street,
Futian District, Shenzhen

Phone: 0755-82889188-8118

Guangzhou Office: Room 902, Floor 9, Xiaocong Science Park, 266 Chigang
West Road, Haizhu District, Guangzhou

Phone/Fax: 020-84147422