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

■New Application □Modification □Other:

Report ID: 2018046J04138XG1

Sample Name: Uhome-NCA

Model/Type: 6.8kWh/LV
50.4V 135Ah 6800Wh

Applicant: AOBO ENVIRONMENTAL NEW ENERGY (WUXI) CO.,LTD.

CQC Intime Testing Technology Co.,Ltd

# TEST REPORT

**Report ID**: 2018046J04138XG1

**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:** AOBO ENVIRONMENTAL NEW ENERGY (WUXI) CO.,LTD.

**Address:** SUMIAO VILLAGE,QIANQIAO STREET,HUISHAN DISTRICT,WUXI CITY,JIANGSU PROVINCE (INDUSTRIAL CONCENTRATION ZONE)

**Sample Name:** Uhome-NCA **Trade Mark:** AOBOET

**Model/Type:** 6.8kWh/LV **Ratings:** 50.4V 135Ah 6800Wh

**Manufacturer:** AOBO ENVIRONMENTAL NEW ENERGY (WUXI) CO.,LTD.

**Address:** SUMIAO VILLAGE,QIANQIAO STREET,HUISHAN DISTRICT,WUXI CITY,JIANGSU PROVINCE (INDUSTRIAL CONCENTRATION ZONE)

**Standard Specification**: UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part Ⅲ, 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:** 2018-04-04

**Finished Date:** 2018-06-07

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

**Testing Conditions**: Temperature: 23.4℃～24.5℃ Relative Humidity: 53.7%~65.5%

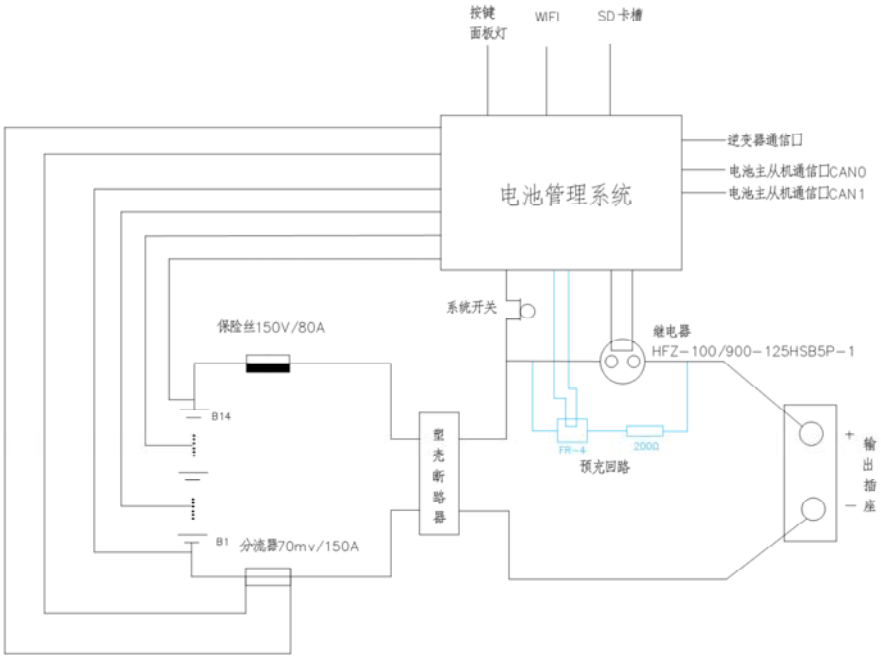
| | | | | |
|---|---|---|---|---|
| **Engineer:** Cao Wei | Signature: Cao Wei | Date: 2018.06.07 | Seal of CQC IT<br>Date of issue:<br>2018.06.07 |
| **Auditor:** Hou Fengwen | Signature: Hou Fengwen | Date: 2018.06.07 | |
| **Approver:** Zhao Runsheng | Signature: Zhao Runsheng | Date: 2018.06.07 | |

**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

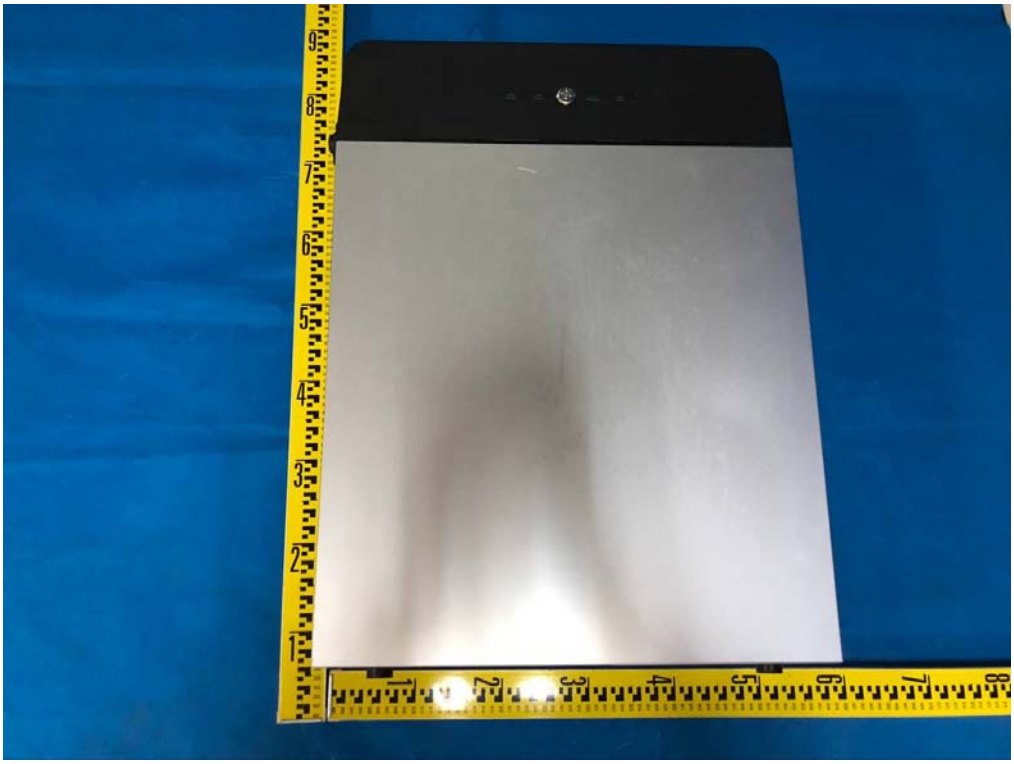
## The Table of Battery Fundamental Parameters

| Item | Rated Performance | Item | Rated Performance |
|---|---|---|---|
| Nominal capacity (Ah) | 135 | Nominal voltage(V) | 50.4 |
| Rated power(Wh) | 6800 | Limited charge voltage(V) | 57.5 |
| Charge current(A) | 60.0 | Maximum continous charging current (A) | 60 |
| End charge current(mA) | 1000 | Discharge current(A) | 60 |
| Cut-off voltage (V) | 43 | Cell numbers | 616 |
| Maximum discharge current(A) | 100 | Type of cellt(mm) | Cylindrical Φ ≥18 |
| Permutation of cell | 14S44P | Capacity of cell(Ah) | 3.2 |
| -- | -- | -- | -- |
| -- | -- | -- | -- |

## The Battery Electrical Connection Diagram

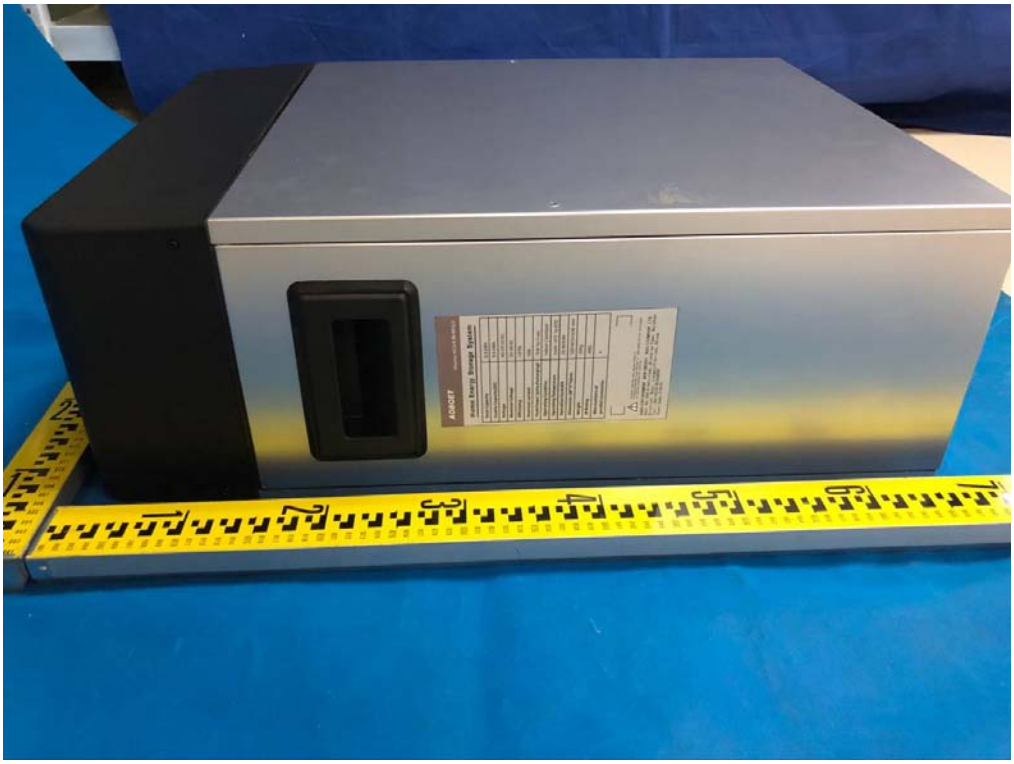


## Sample photograph-1

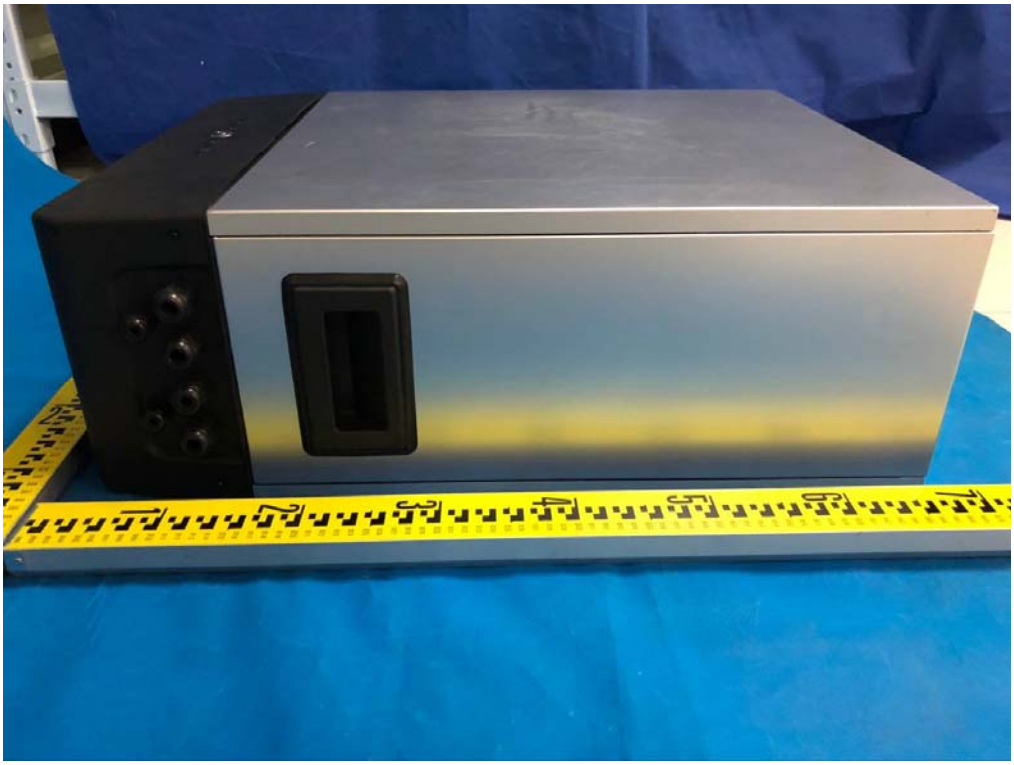


## Sample photograph-2

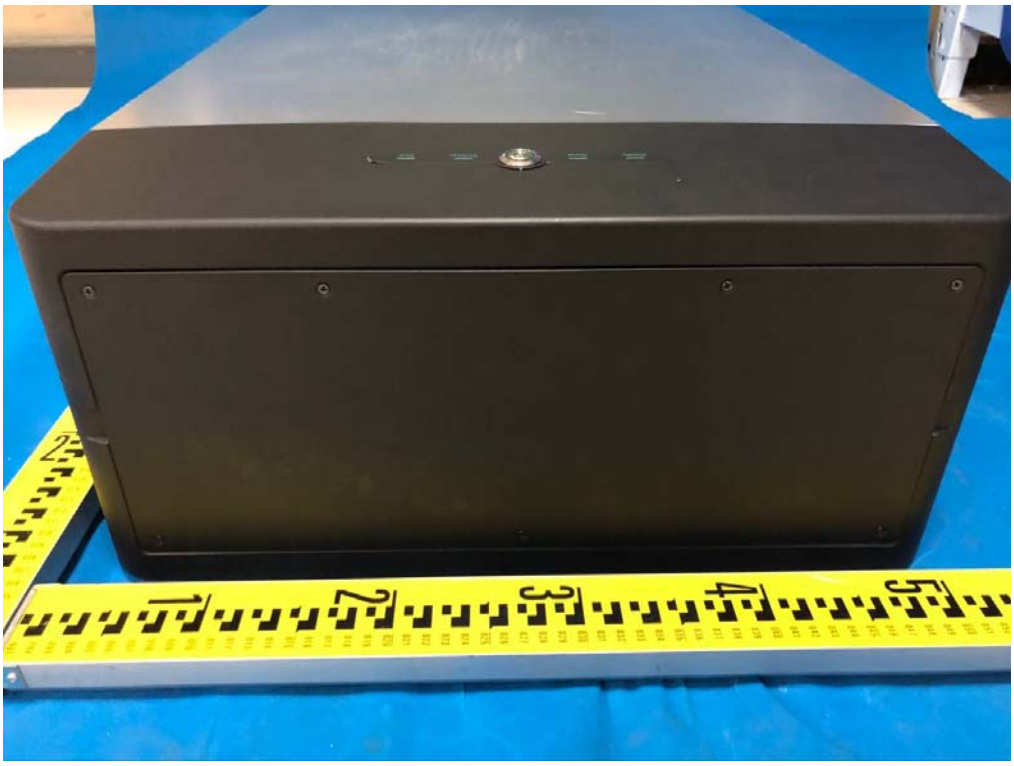
## Sample photograph-3



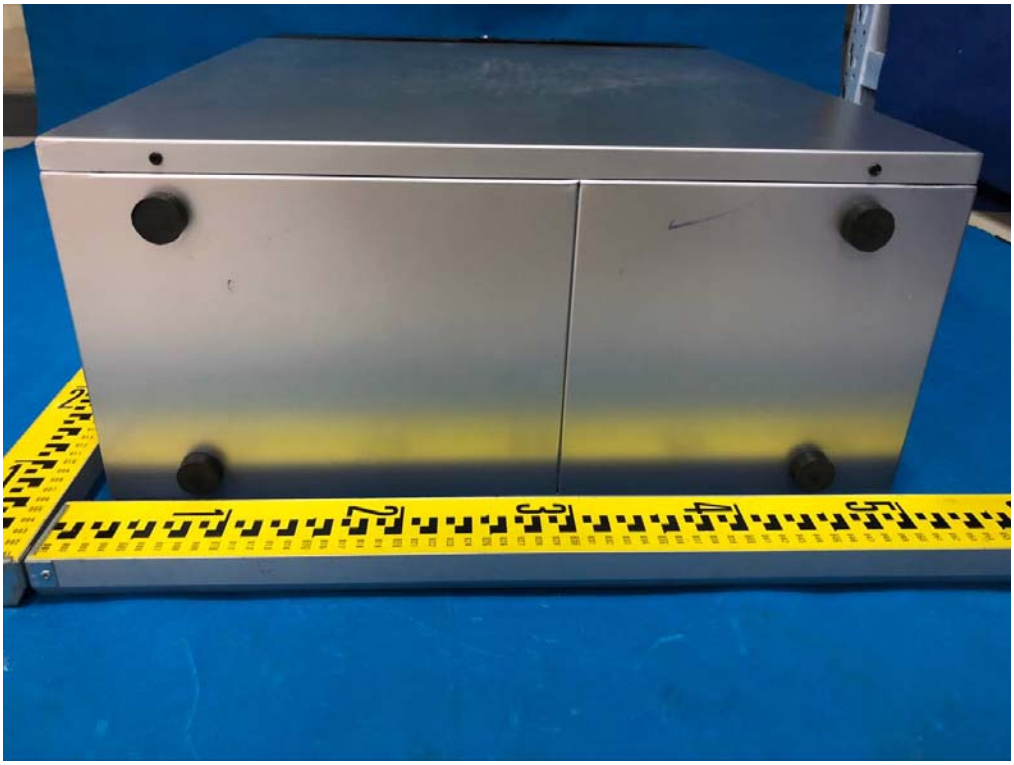
## Sample photograph-4



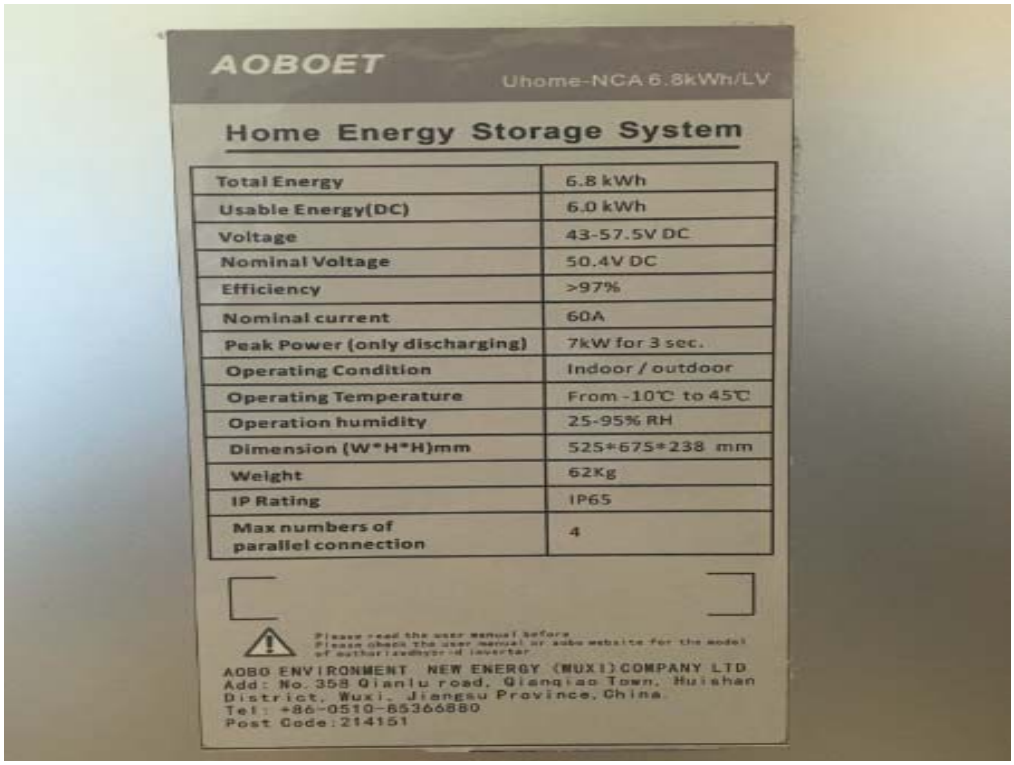
**Sample photograph-5**



**Sample photograph-6**



## Sample photograph-7




## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.1 Altitude simulation** | **Battery at first cycle in fully charged state.**<br><br>Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5℃). | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage,<br>Mass loss limit 0.1%. | / | Group1<br>Group2 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage.<br>No mass loss.<br>Test data is shown in Annex 1. | P |
| | **Battery after 25 cycles in fully charged state.**<br><br>Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5℃). | | / | Group3<br>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 Conclu-sion |
|---|---|---|---|---|---|---|
| 38.3.4.2 Thermal test | **Battery at first cycle in fully charged state.**<br><br>Test batteries are to be stored for at least six hours at a test temperature equal to 75±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. 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±5℃). | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%. | / | Group1<br>Group2 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage.<br>No mass loss.<br>Test data is shown in Annex 2. | P |
| | **Battery after 25 cycles in fully charged state.**<br><br>Test batteries are to be stored for at least six hours at a test temperature equal to 75±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. 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±5℃). | | / | Group3<br>Group4 | | P |

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## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.3 Vibration** | **Battery at first cycle in fully charged state.**<br><br>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.<br>The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 $g_n$ is maintained until18 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 50 Hz). A peak acceleration of 2 $g_n$ is then maintained until the frequency is increased to 200 Hz. | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage,<br>Mass loss limit 0.1%. | / | Group1<br>Group2 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage<br>No mass loss.<br>Test data is shown in Annex 3. | P |

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## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.3 Vibration** | **Battery after 25 cycles in fully charged state.**<br><br>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.<br>The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 $g_n$ is maintained until18 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 50 Hz). A peak acceleration of 2 $g_n$ is then maintained until the frequency is increased to 200 Hz. | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage,<br>Mass loss limit 0.1%. | / | Group3<br>Group4 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage<br>No mass loss .<br>Test data is shown in Annex 3. | P |

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## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.4 Shock** | **Battery at first cycle in fully charged state.**<br><br>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.<br>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g n (or Acceleration(g n )= $\sqrt{(\frac{100850}{mass})}$, 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 )= $\sqrt{(\frac{30000}{mass})}$, 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. | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage,<br>Mass loss limit 0.1%. | / | Group1<br>Group2 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage.<br>No mass loss .<br>Test data is shown in Annex 4. | P |

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## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.4 Shock** | **Battery after 25 cycles in fully charged state.**<br><br>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.<br>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g n (or Acceleration(g n )= $\sqrt{(\frac{100850}{mass})}$, 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 )= $\sqrt{(\frac{30000}{mass})}$, 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. | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage,<br>Mass loss limit 0.1%. | / | Group3<br>Group4 | No leakage<br>No venting<br>No disassembly<br>No rupture<br>No fire<br>The open circuit voltage of each test battery after testing is not less than 90% of its voltage.<br>No mass loss .<br>Test data is shown in Annex 4. | P |

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## 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.5 External short circuit** | **Battery at first cycle in fully charged state.**<br><br>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 57±4℃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 ±4℃. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃.<br>The battery must be observed for a further six hours for the test to be concluded. | External temperature does not exceed 170℃.<br>No disassembly<br>No rupture<br>No fire | / | Group1<br>Group2 | External temperature does not exceed 170℃.<br>No disassembly<br>No rupture<br>No fire<br>Test data is shown in Annex 5. | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.5 External short circuit** | **Battery after 25 cycles in fully charged state.**<br><br>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 57±4℃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 ±4℃. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃.<br>The battery must be observed for a further six hours for the test to be concluded. | External temperature does not exceed 170℃.<br>No disassembly<br>No rupture<br>No fire | / | Group3<br>Group4 | External temperature does not exceed 170℃.<br>No disassembly<br>No rupture<br>No fire<br>Test data is shown in Annex 5. | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.6 Impact** | **Cell at first cycle at 50% of the design rated capacity.**<br><br>The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.<br>The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact. The battery must be observed for a further six hours for the test to be concluded. | External temperature does not exceed 170℃.<br>No disassembly<br>No fire | / | 1 #<br>2 #<br>3 #<br>4 #<br>5 # | External temperature does not exceed 170℃.<br>No disassembly<br>No fire<br>Test data is shown in Annex 6. | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.7 Overcharge** | **Battery at first cycle in fully discharged state.**<br><br>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:<br>(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.<br>(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.<br>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. | No disassembly<br>No fire | / | Group5<br>Group6 | No disassembly<br>No fire<br>Test data is shown in Annex 7 | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.7 Overcharge** | **Battery after 25 cycles in fully charged state.**<br><br>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:<br>(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.<br>(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.<br>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. | No disassembly<br>No fire | / | Group7<br>Group8 | No disassembly<br>No fire<br>Test data is shown in Annex 7 | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.8 Forced discharge** | **Battery at first cycle in fully discharged state.**<br><br>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.<br>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).<br>The test sample shall be observed for a further 7 days. | No disassembly<br>No fire | / | 6#-15# | No disassembly<br>No fire<br>Test data is shown in Annex 8 | 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 Conclu-sion |
|---|---|---|---|---|---|---|
| **38.3.4.8 Forced discharge** | **Battery after 50 cycles in fully charged state.**<br><br>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.<br>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).<br>The test sample shall be observed for a further 7 days. | No disassembly<br>No fire | / | 16#-25# | No disassembly<br>No fire<br>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 | 2018-06-28 | √ |
| 2 | Thermal Shock Chambers | KWGDS61 | ITCB16001 | 2019-04-13 | √ |
| 3 | Vibration Tester | HV-300-D-25 | ITCEN07007 | 2018-10-15 | |
| 4 | Vibration Tester System | DL-8000-80 | ITCE11009 | 2019-04-13 | √ |
| 5 | Battery Shock Tester | IS350 | ITCB180207 | 2019-03-05 | |
| 6 | High Temperature Explosion-proof Chamber | BE-101-512A | ITCB16005 | 2018-11-06 | √ |
| 7 | Battery Impact Tester | H-FZ-500 | ITCEN07009 | 2019-04-13 | √ |
| 8 | Battery Crush Tester | GX-5067-C | ITCB16006 | 2018-11-16 | |
| 9 | Electric Vehicle Battery Tester | BNT100-0100ME | ITCB13010 | 2018-06-28 | |
| 10 | Electric Vehicle Battery Tester | BNT100-0100ME | ITCB13011 | 2018-06-28 | √ |
| 11 | High Temperature Explosion-proof Chamber | BE-101-512A | ITCB16004 | 2018-11-06 | √ |
| 12 | High-precision battery tester | CT-3008W-20V6A | ITCS110202 | 2018-06-20 | |
| 13 | High-precision battery tester | CT-4004-5V100A-NFA | ITCB15004 | 2018-06-28 | √ |
| 14 | High Temperature Explosion-proof Chamber | SPHH-101 | ITCS06031 | 2018-06-20 | √ |
| 15 | Battery internal resistance tester | BT3563 | ITCB14001 | 2018-11-06 | √ |
| 16 | Temperature Recorder | MV2020 | ITCS111001 | 2019-04-13 | √ |
| 17 | Digital Multicenter | FLUKE177 | ITCS06060-3 | 2018-06-20 | √ |
| 18 | Electronic Scale | JX-A30002 | ITCB170602 | 2018-06-20 | |
| 19 | Electronic Scale | BCS-ACSC-30 | ITCS11030 | 2018-06-20 | √ |
| 20 | Electronic Scale | XK3150(C) | ITCH14030 | 2018-06-20 | √ |

# 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 | 56.53 | 61.80 | 56.49 | 61.80 | 99.93% | 0.000% | -- |
| Group 2 | First cycle fully charged | 56.51 | 61.77 | 56.48 | 61.77 | 99.95% | 0.000% | -- |
| Group 3 | After 25 cycles fully charged | 56.49 | 61.90 | 56.43 | 61.90 | 99.89% | 0.000% | -- |
| Group 4 | After 25 cycles fully charged | 56.56 | 61.83 | 56.51 | 61.83 | 99.91% | 0.000% | -- |
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**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 | 56.49 | 61.80 | 56.34 | 61.76 | 99.73% | 0.065% | -- |
| Group 2 | First cycle fully charged | 56.48 | 61.77 | 56.34 | 61.74 | 99.75% | 0.049% | -- |
| Group 3 | After 25 cycles fully charged | 56.43 | 61.90 | 56.31 | 61.86 | 99.79% | 0.065% | -- |
| Group 4 | After 25 cycles fully charged | 56.51 | 61.83 | 56.33 | 61.80 | 99.68% | 0.049% | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
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**Remarks:**
**NL:** No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
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## 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 | 56.34 | 61.76 | 56.27 | 61.74 | 99.88% | 0.032% | -- |
| Group 2 | First cycle fully charged | 56.34 | 61.74 | 56.24 | 61.73 | 99.82% | 0.016% | -- |
| Group 3 | After 25 cycles fully charged | 56.31 | 61.86 | 56.24 | 61.84 | 99.88% | 0.032% | -- |
| Group 4 | After 25 cycles fully charged | 56.33 | 61.80 | 56.26 | 61.78 | 99.88% | 0.032% | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
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**Remarks:**
**NL:** No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
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## 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 | 56.27 | 61.74 | 56.27 | 61.74 | 100.00% | 0.000% | -- |
| Group 2 | First cycle fully charged | 56.24 | 61.73 | 56.24 | 61.73 | 100.00% | 0.000% | -- |
| Group 3 | After 25 cycles fully charged | 56.24 | 61.84 | 56.24 | 61.84 | 100.00% | 0.000% | -- |
| Group 4 | After 25 cycles fully charged | 56.26 | 61.78 | 56.26 | 61.78 | 100.00% | 0.000% | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
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**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

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## TEST REPORT

### Annex 5. External Short Circuit

| No | Battery Condition | Voltage（V） | Initial Temperature (℃) | Max Temperature (℃) | Remarks |
|---|---|---|---|---|---|
| Group 1 | First cycle fully charged | 56.27 | 56.0 | 56.3 | -- |
| Group 2 | First cycle fully charged | 56.24 | 56.2 | 56.4 | -- |
| Group 3 | After 25 cycles fully charged | 56.24 | 56.1 | 56.4 | -- |
| Group 4 | After 25 cycles fully charged | 56.26 | 56.1 | 56.3 | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
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| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |

**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

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## TEST REPORT

### Annex 6. Impact

| No | Battery Condition | Voltage（V） | Initial Temperature (℃) | Max Temperature (℃) | Remarks |
|---|---|---|---|---|---|
| 1 | First cycle in 50% rated capacity | 3.524 | 21.5 | 112.1 | -- |
| 2 | First cycle in 50% rated capacity | 3.524 | 21.7 | 116.8 | -- |
| 3 | First cycle in 50% rated capacity | 3.524 | 21.4 | 112.9 | -- |
| 4 | First cycle in 50% rated capacity | 3.524 | 21.3 | 114.5 | -- |
| 5 | First cycle in 50% rated capacity | 3.523 | 21.4 | 113.0 | -- |
| -- | -- | | | | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
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| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |

**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

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## TEST REPORT

## Annex 7. Overcharge

| No | Battery Condition | Voltage（V） | Initial Temperature (℃) | Max Temperature (℃) | Remarks |
|---|---|---|---|---|---|
| Group 5 | First cycle fully charged | 56.51 | 23.4 | 23.6 | -- |
| Group 6 | First cycle fully charged | 56.55 | 23.5 | 23.6 | -- |
| Group 7 | After 25 cycles fully charged | 56.52 | 23.1 | 23.3 | -- |
| Group 8 | After 25 cycles fully charged | 56.53 | 23.3 | 23.4 | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
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**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 (℃) | Max Temperature (℃) | Remarks |
|---|---|---|---|---|---|
| 6 # | First cycle in fully charged | 3.331 | 24.1 | 38.2 | -- |
| 7# | First cycle in fully charged | 3.328 | 24.2 | 39.0 | -- |
| 8# | First cycle in fully charged | 3.330 | 24.3 | 38.5 | -- |
| 9# | First cycle in fully charged | 3.333 | 24.2 | 39.4 | -- |
| 10# | First cycle in fully charged | 3.339 | 24.0 | 38.3 | -- |
| 11# | First cycle in fully charged | 3.328 | 24.4 | 39.1 | -- |
| 12# | First cycle in fully charged | 3.332 | 24.3 | 36.9 | -- |
| 13# | First cycle in fully charged | 3.333 | 24.2 | 38.3 | -- |
| 14# | First cycle in fully charged | 3.333 | 23.9 | 39.0 | -- |
| 15# | First cycle in fully charged | 3.335 | 24.1 | 39.7 | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |

**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 (℃) | Max Temperature (℃) | Remarks |
|---|---|---|---|---|---|
| 16# | After 50 cycles in fully charged | 3.332 | 23.9 | 39.1 | -- |
| 17# | After 50 cycles in fully charged | 3.333 | 24.2 | 27.9 | -- |
| 18# | After 50 cycles in fully charged | 3.332 | 24.1 | 38.6 | -- |
| 19# | After 50 cycles in fully charged | 3.332 | 24.2 | 38.5 | -- |
| 20# | After 50 cycles in fully charged | 3.335 | 24.3 | 39.2 | -- |
| 21# | After 50 cycles in fully charged | 3.331 | 24.1 | 38.5 | -- |
| 22# | After 50 cycles in fully charged | 3.330 | 23.8 | 39.0 | -- |
| 23# | After 50 cycles in fully charged | 3.333 | 24.0 | 38.3 | -- |
| 24# | After 50 cycles in fully charged | 3.329 | 24.2 | 39.4 | -- |
| 25# | After 50 cycles in fully charged | 3.332 | 24.0 | 38.6 | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
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| | -- | -- | -- | -- | -- |

**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 ℃.

——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.

5. This report only as a reference for client, can't be considered as a basis for litigation, arbitration and so on.

6. This report instead of the report number which is "2018046J04138", and the original report is superseded when the new report is published.

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