Report No.: GZABB190722008-01

APPLICATION FOR IEC TEST REPORT

Client Name	:	Hubei Lanbotai New Energy Co., Ltd
Address	:	The two building of Hualinkindergarten back yard, Jujube City, Hubei Province, translated into
Product Name	:	Polymer Li-ion Cell
Date	:	Jul. 26, 2019

Anbotek (Guangzhou) Compliance Laboratory Limited

TEST REPORT

EN 62133: 2012

Secondary cells and batteries containing alkaline or other non-acid electrolytes — Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Report		
Reference No.	:	GZABB190722008-01
Compiled by (+ signature)	:	King Chen / Project Engineer
Approved by (+ signature)	:	Terry Tian / Project Manager
Date of issue	:	Jul. 26, 2019
Contents	:	22 pages (including 1 pages of photos)
Testing laboratory		
Name	:	Anbotek (Guangzhou) Compliance Laboratory Limited
Address	:	Rm.508, Bld.2, No.232, Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China
Testing location	:	Anbotek (Guangzhou) Compliance Laboratory Limited
Client		
Name	:	Hubei Lanbotai New Energy Co., Ltd.
Address	:	The two building of Hualinkindergarten back yard, Jujube City, Hubei Province, translated into
Test specification		
Standard	:	IEC 62133: 2012
Test procedure	:	Compliance with IEC 62133: 2012
Non-standard test method	:	N.A.
Test item		
Description	:	Polymer Li-ion Cell
Trademark	:	N.A.
Model and/or type reference	:	401214
Manufacturer	:	Same as client
Address	:	Same as client
Factory	:	Same as client
Address	:	Same as client
Rating(s)	:	DC 3.7V, 35mAh

Particulars: test item vs. test requirements

Ambient temperature ..... : 20°C ± 5°C.

Test case verdicts

Test case does not apply to the test object ..... : N (.A.)

Test item does meet the requirement ..... : P (ass)

Test item does not meet the requirement ..... : F (ail)

Testing

Date of receipt of test item ..... : Jun. 25, 2018

Date(s) of performance of test ..... : Jun. 25, 2018 to Jul. 25, 2019

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

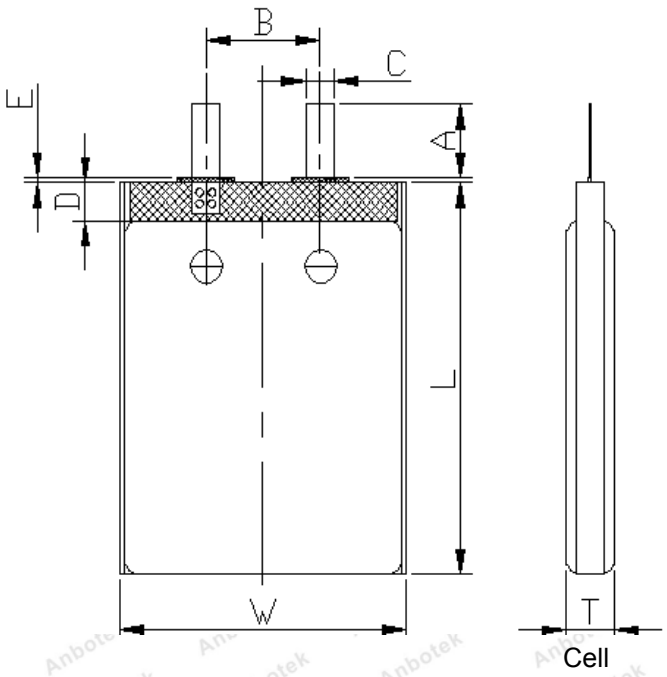
The test results presented in this report are only relevant to the test sample.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a dot is used as the decimal separator.

Construction

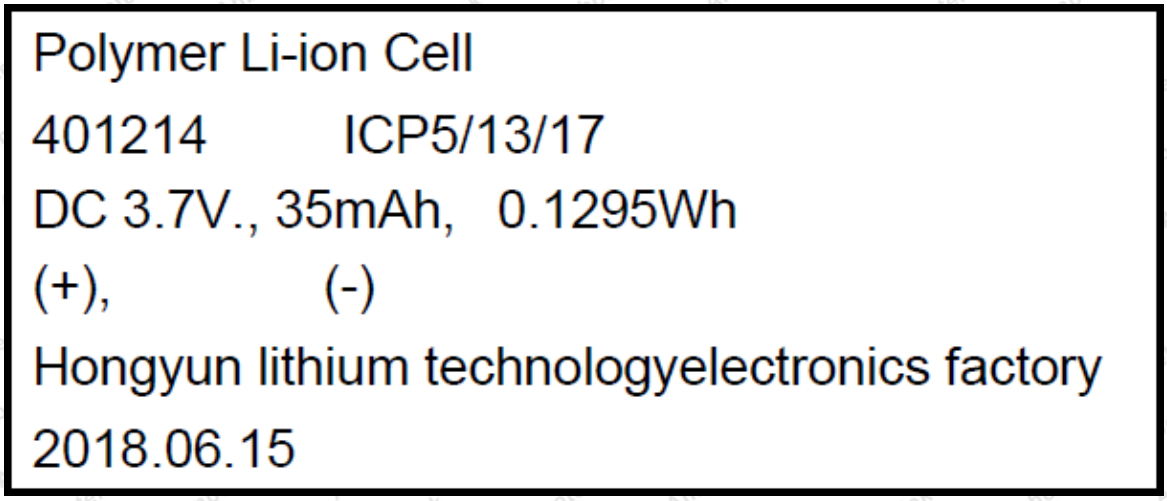


Cell

test item	technical specification
T	Max4.1mm
W	Max12.2mm
H	Max17mm
C	Max2.1mm
A	Max8mm
D	Max4mm
E	Max1.5mm

Copy of marking plate:

The artwork below may be only a draft.



General product information and other remarks:

The cell consists of the positive electrode plate, negative electrode plate, separator, electrolyte and case.

The positive and negative electrode plates are housed in the case in the state being separated by the separator.

The main features of the cells are show as below(clause 8.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Final Voltage
401214	35mAh	3.7V	7mA	7mA	35mA	35mA	4.2V	2.42V

The main features of the cells are show as below(clause 8.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
401214	4.25V	1.75mA	0℃	45℃

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict

4	**PARAMETER MEASUREMENT TOLERANCES**		**P**
	Parameter measurement tolerances		P

5	**General safety considerations**		**P**
5.1	General		P
5.2	Insulation and wiring		N
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ	No metal case exists.	N
	Insulation resistance (MΩ).....:		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		N
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting mechanism exists on the narrow side of pouch cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N
5.4	Temperature/voltage/current management	Cell only	N
	Batteries are designed such that abnormal temperature rise conditions are prevented		N
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		N
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified		N
5.5	Terminal contacts		P
	Terminals have a clear polarity marking on the external surface of the battery	The “+” and “-” polarity explicitly marked on surface of the cell.	P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Complied.	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Complied.	P
	Terminal contacts are arranged to minimize the risk of short circuits	Complied.	P
5.6	Assembly of cells into batteries	Cell only	N
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N
	Each battery has an independent control and protection		N
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges		N
	Protective circuit components are added as appropriate and consideration given to the end-device application		N
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N
5.6.2	Design recommendation for lithium systems only		N
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or	Cell only	N
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.		N

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		N
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N
5.7	Quality plan		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery		P
6	**Type test conditions**		**P**
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Complied. Table 2 for Lithium system.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	Tests are carried out at 20°C ± 5°C.	P
7	**Specific requirements and tests (nickel systems)**		**N**
7.1	Charging procedure for test purposes	Lithium system.	N
7.2	Intended use		N
7.2.1	Continuous low-rate charging (cells)		N

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion		N
7.2.2	Vibration		N
	Results: No fire. No explosion. No leakage		N
7.2.3	Moulded case stress at high ambient temperature		N
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N
7.2.4	Temperature cycling		N
	Results: No fire. No explosion. No leakage.		N
7.3	Reasonably foreseeable misuse		N
7.3.1	Incorrect installation cell		N
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or		N
	- A stabilized dc power supply.		N
	Results: No fire. No explosion .....:		N
7.3.2	External short circuit		N
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		N
	Results: No fire. No explosion .....:		N
7.3.3	Free fall		N
	Results: No fire. No explosion.		N
7.3.4	Mechanical shock (crash hazard)		N
	Results: No fire. No explosion. No leakage.		N
7.3.5	Thermal abuse		N
	Oven temperature (°C) ..... :		—
	Results: No fire. No explosion.		N
7.3.6	Crushing of cells		N
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N
	Results: No fire. No explosion .....:		N
7.3.7	Low pressure		N
	Chamber pressure (kPa) ..... :		—
	Results: No fire. No explosion. No leakage.		N
7.3.8	Overcharge		N
	Results: No fire. No explosion .....:		N
7.3.9	Forced discharge		N
	Results: No fire. No explosion .....:		N
8	**Specific requirements and tests (lithium systems)**		**P**
8.1	Charging procedures for test purposes		P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2		P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9		P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5°C for the upper limit and minus 5°C for the lower limit	Charge temperature 0-45°C declared.	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1).....:		P
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly	Lithium cobalt oxide system only.	N
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1).....:		N
8.2	Intended use		P
8.2.1	Continuous charging at constant voltage (cells)	Test complied.	P
	Results: No fire. No explosion .....:	(See Table 8.2.1)	P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.2	Moulded case stress at high ambient temperature (battery)	No moulded case existed.	N
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery casing resulting in exposure of internal components		N
8.3	Reasonably foreseeable misuse		P
8.3.1	External short circuit (cell)		P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion .....:	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)	Cell only	N
	The batteries were tested until one of the following occurred: - 24 hours elapsed; or		N
	- The case temperature declined by 20% of the maximum temperature rise		N
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N
	Results: No fire. No explosion .....:	(See Table 8.3.2)	N
8.3.3	Free fall		P
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.4	Thermal abuse (cells)		P
	The cells were held at 130°C ± 2°C for: - 10 minutes; or	Test complied.	P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N
	Oven temperature (°C) ..... :	130°C	—
	Gross mass of cell (g) ..... :	<500g, small cell.	—
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.5	Crush (cells)	Tested complied.	P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N
	- 10% of deformation has occurred compared to the initial dimension		N
	Results: No fire. No explosion .....:	(See Table 8.3.5)	P
8.3.6	Over-charging of battery	Cell only	N
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		N
	- Returned to ambient		N
	Results: No fire. No explosion .....:	(See Table 8.3.6)	N
8.3.7	Forced discharge (cells)	Test complied.	P
	Results: No fire. No explosion .....:	(See Table 8.3.7)	P
8.3.8	Transport tests		P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods	(See Table 8.3.8)	P
8.3.9	Design evaluation – Forced internal short circuit (cells)	Tested complied.	P
	The cells complied with national requirement for..... :	For France, Japan, Republic of Korea and Switzerland.	—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N for prismatic cells	P
	Results: No fire.....:	(See Table 8.3.9)	P

9	**Information for safety**		**P**
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Cell specifications provided.	P
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.		N
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user .....:		N
10	**Marking**		**P**
10.1	Cell marking		P
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.	See marking plate on page 5.	P
10.2	Battery marking		N
	Batteries marked in accordance with the requirements for the cells from which they are assembled.		N
	Batteries marked with an appropriate caution statement.		N
10.3	Other information		P
	Storage and disposal instructions marked on or supplied with the battery.		P
	Recommended charging instructions marked on or supplied with the battery.	Information for recommended charging instructions mentioned in manufacturer's specifications.	P
11	**Packaging**		**P**
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants.		P
Annex A	**Charging range of secondary lithium ion cells for safe use**		**P**
A.1	General		P
A.2	Safety of lithium-ion secondary battery	Complied.	P
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General	Charging voltage is 4.2V	P
A.3.2	Upper limit charging voltage	4.25V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.25V applied.	N
A.4	Consideration of temperature and charging current		P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is: 0-45°C	P
A.4.3	High temperature range	Not higher than the temperature range specific in this standard.	N
A.4.3.1	General		N
A.4.3.2	Explanation of safety viewpoint		N
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		N
A.4.4	Low temperature range	Lower than the temperature range specific in this standard.	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	-5°C applied.	P
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
	The insertion procedure carried out at 20°C±5°C and under -25°C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N
A.5.5.1	Insertion of nickel particle to winding core		N
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N
A.5.6	Insertion of nickel particle to prismatic cell		P

	TABLE: List of critical components				P
Object/part No.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard (Edition / year)**	**Mark(s) of conformity[1])**
Cell	Hongyun lithium technologyelectronics factory	401214	3.7V, 35mAh	IEC 62133:2012	Test with appliance
1) An asterisk indicates a mark which assures the agreed level of surveillance.					

8.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample No.	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (mA)**	**OCV at start of test, (Vdc)**	**Results**
C1	4.20	7	4.19	P
C2	4.20	7	4.19	P
C3	4.20	7	4.19	P
C4	4.20	7	4.19	P
C5	4.20	7	4.19	P
Supplementary information: - No fire or explosion - No leakage				

8.2.2	TABLE: Moulded case stress at high ambient temperature (battery)		N
Sample No.	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Results**
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--	--	--	--
--	--	--	--
Supplementary information: - No fire or explosion - No leakage - Others (please explain)			

8.3.1	TABLE: External short circuit (cell)				P
Sample No.	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (mΩ)**	**Maximum case temperature, (°C)**	**Results**
Charging temperature: -5° C					
C6	22.4	4.11	85.3	112.5	P
C7	22.4	4.12	74.9	106.6	P
C8	22.4	4.11	80.2	112.1	P
C9	22.4	4.10	68.6	105.3	P
C10	22.4	4.12	75.3	114.1	P
Charging temperature: 45°C					
C11	22.1	4.20	85.3	110.2	P
C12	22.1	4.21	74.9	114.1	P
C13	22.1	4.22	80.2	108.6	P
C14	22.1	4.21	68.6	105.9	P
C15	22.1	4.21	75.3	114.7	P
Supplementary information: - No fire or explosion					

8.3.2	TABLE: External short circuit (battery)				N
Sample No.	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (mΩ)**	**Maximum case temperature (°C)**	**Results**
Charging temperature: -5° C					
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Charging temperature: 45°C					
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Supplementary information: - No fire or explosion					

8.3.3	TABLE: Free fall		P
Sample No.	**OCV at start of test, (Vdc)**	**OCV at removal of thermal free fall, (Vdc)**	**Results**
C16	4.17	4.17	P
C17	4.17	4.17	P
C18	4.17	4.17	P
Supplementary information: - No fire or explosion			

8.3.4	TABLE: Thermal abuse (cells)			P
Sample No.	**OCV at start of test, (Vdc)**	**Ambient, (°C)**	**Temperature raised at a rate, (°C)**	**Results**
Charging temperature: -5° C				
C19	4.12	130±2	5°C/min	P
C20	4.11	130±2	5°C/min	P
C21	4.10	130±2	5°C/min	P
C22	4.12	130±2	5°C/min	P
C23	4.10	130±2	5°C/min	P
Charging temperature: 45°C				
C24	4.21	130±2	5°C/min	P
C25	4.21	130±2	5°C/min	P
C26	4.20	130±2	5°C/min	P
C27	4.21	130±2	5°C/min	P
C28	4.21	130±2	5°C/min	P
Supplementary information: - No fire or explosion				

8.3.5	TABLE: Crush (cells)				P
Sample No.	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Width/ diameter of cell before crush, (mm)**	**Required deformation for crush, (mm)**	**Results**
A cylindrical or prismatic cell is crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. Test only the wide side of prismatic cells. The maximum force of 13kN±1kN has been applied.					
Charging temperature: -5° C					
C29	4.11	0	--	--	P
C30	4.11	0	--	--	P
C31	4.12	0	--	--	P
C32	4.11	0	--	--	P
C33	4.10	0	--	--	P
Charging temperature: 45°C					
C34	4.20	0	--	--	P
C35	4.21	0	--	--	P
C36	4.21	0	--	--	P
C37	4.21	0	--	--	P
C38	4.21	0	--	--	P
Supplementary information: - No fire or explosion					

8.3.6	TABLE: Over-charging of battery			N
Supply voltage (Vdc) ..... :				—
Sample No.	**OCV before charging, (Vdc)**	**Constant charging current (mA)**	**Maximum outer casing temperature, (°C)**	**Results**
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Supplementary information: - No fire or explosion				

8.3.7	TABLE: Forced discharge (cells)			P
Sample No.	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_t, (mA)	Time for reversed charge, (minutes)	Results
C39	3.43	35	90	P
C40	3.42	35	90	P
C41	3.42	35	90	P
C42	3.44	35	90	P
C43	3.44	35	90	P
Supplementary information: - No fire or explosion				

8.3.8 Table for datail data

1. Altitude simulation

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
C44	0.7536	4.168	0.7536	4.168	0.00	0.00	N
C45	0.7396	4.174	0.7396	4.174	0.00	0.01	N
C46	0.7641	4.170	0.7641	4.170	0.00	0.00	N
C47	0.7718	4.167	0.7717	4.167	0.01	0.00	N
C48	0.7605	4.165	0.7605	4.165	0.00	0.00	N
C49	0.7748	4.170	0.7748	4.170	0.00	0.01	N
C50	0.7616	4.171	0.7616	4.171	0.00	0.00	N
C51	0.7619	4.169	0.7618	4.169	0.01	0.00	N
C52	0.7504	4.173	0.7504	4.173	0.00	0.01	N
C53	0.7487	4.171	0.7487	4.171	0.00	0.00	N

2. Thermal test

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
C44	0.7536	4.168	0.7532	4.152	0.05	0.38	N
C45	0.7396	4.174	0.7393	4.157	0.04	0.40	N
C46	0.7641	4.170	0.7638	4.154	0.04	0.38	N
C47	0.7717	4.167	0.7713	4.150	0.06	0.41	N
C48	0.7605	4.165	0.7601	4.149	0.05	0.38	N
C49	0.7748	4.170	0.7745	4.155	0.04	0.35	N

C50	0.7616	4.171	0.7613	4.154	0.04	0.41	N
C51	0.7618	4.169	0.7615	4.153	0.04	0.38	N
C52	0.7504	4.173	0.7500	4.157	0.05	0.37	N
C53	0.7487	4.171	0.7484	4.155	0.05	0.38	N

3. Vibration

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
C44	0.7532	4.152	0.7532	4.152	0.00	0.00	N
C45	0.7393	4.157	0.7392	4.157	0.01	0.00	N
C46	0.7638	4.154	0.7638	4.154	0.00	0.01	N
C47	0.7713	4.150	0.7713	4.150	0.00	0.00	N
C48	0.7601	4.149	0.7601	4.149	0.00	0.00	N
C49	0.7745	4.155	0.7744	4.155	0.01	0.00	N
C50	0.7613	4.154	0.7613	4.154	0.00	0.00	N
C51	0.7615	4.153	0.7615	4.153	0.00	0.01	N
C52	0.7500	4.157	0.7500	4.157	0.00	0.01	N
C53	0.7484	4.155	0.7484	4.155	0.00	0.00	N

4. Shock

No.	Pre-test		After test		Mass loss (%)	Voltage loss (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N)
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
C44	0.7532	4.152	0.7532	4.152	0.00	0.00	N
C45	0.7392	4.157	0.7392	4.157	0.00	0.00	N
C46	0.7638	4.154	0.7637	4.153	0.01	0.01	N
C47	0.7713	4.150	0.7713	4.150	0.00	0.00	N
C48	0.7601	4.149	0.7601	4.149	0.00	0.01	N
C49	0.7744	4.155	0.7744	4.155	0.00	0.00	N
C50	0.7613	4.154	0.7613	4.154	0.00	0.00	N
C51	0.7615	4.153	0.7614	4.153	0.01	0.00	N
C52	0.7500	4.157	0.7500	4.156	0.00	0.01	N
C53	0.7484	4.155	0.7484	4.155	0.00	0.00	N

8.3.9	TABLE: Forced internal short circuit (cells)				N
Sample No.	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location**	**Maximum applied pressure, (N)**	**Results**
Charging temperature: -5℃					
C54	10	4.12	1	400	P
C55	10	4.11	1	400	P
C56	10	4.10	1	400	P
C57	10	4.12	1	400	P
C58	10	4.11	1	400	P
Charging temperature: 45℃					
C59	45	4.21	1	400	P
C60	45	4.20	1	400	P
C61	45	4.22	1	400	P
C62	45	4.21	1	400	P
C63	45	4.20	1	400	P

Supplementary information:

[1)] Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire

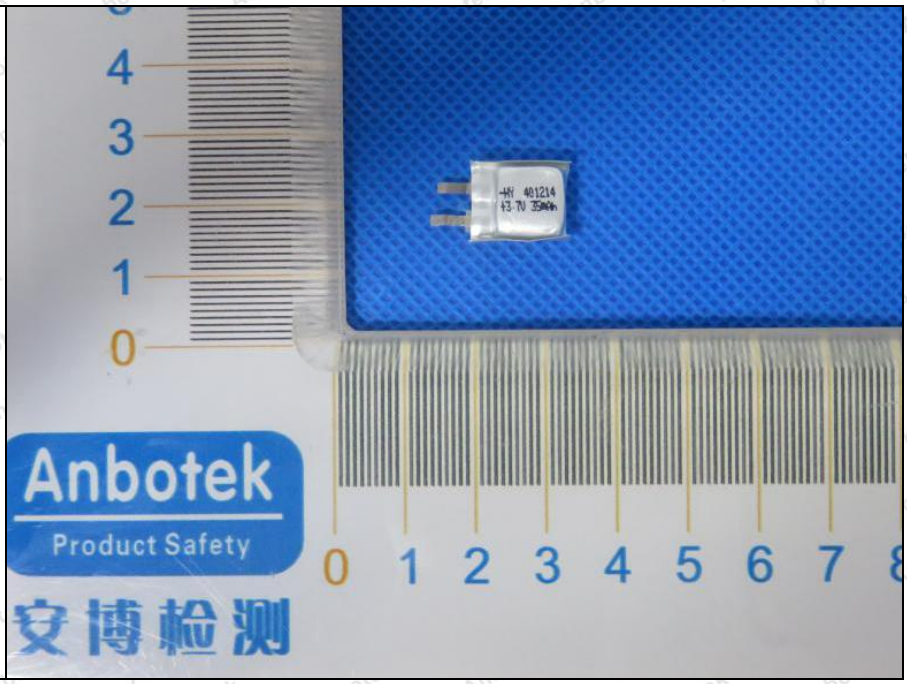
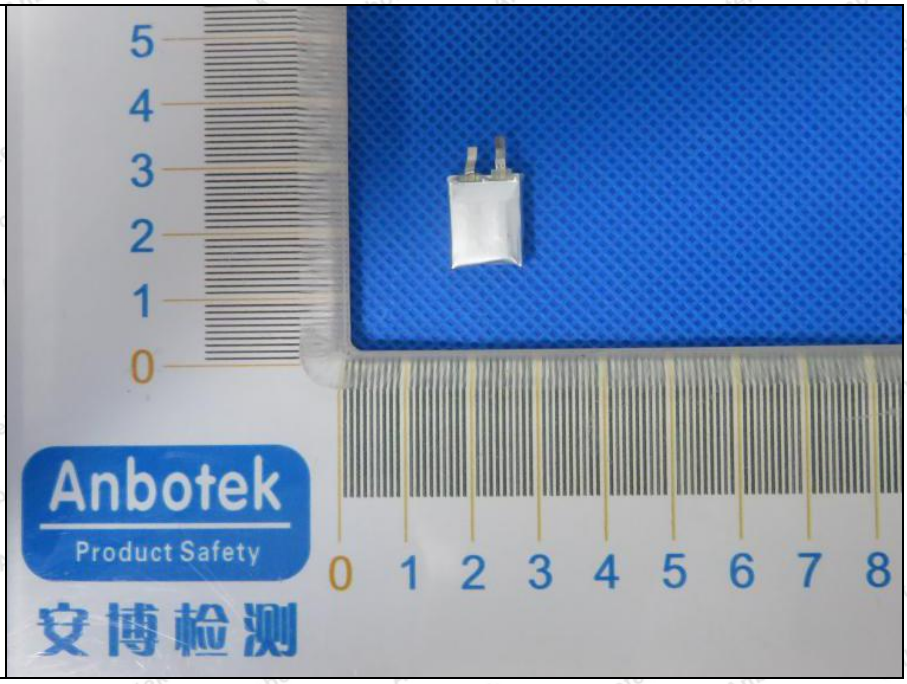
Photo 1 [√] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photo 2 [ ] front [√] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

End of the report