Test Report issued under the responsibility of:

SGS

TEST REPORT
IEC 62133
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 Number. .....:	SZES170700288901
Date of issue .....:	2017-08-22
Total number of pages.....	20 Pages

Applicant's name.....:	
Address .....:	

Test specification:	
Standard.....:	IEC 62133: 2012 (Second Edition)
Test procedure .....:	Commission testing
Non-standard test method.....:	N/A

Test Report Form No.....:	IEC62133B
Test Report Form(s) Originator ....:	UL(Demko)
Master TRF.....:	Dated 2013-03

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....:	Rechargeable Li-ion Polymer Cell
Trade Mark .....:	TMB
Manufacturer.....:	Same as applicant
Model/Type reference .....:	9560A0PL
Ratings .....:	Rated Voltage: 3,7 V d.c. Rated Capacity: 8000 mAh (29,6 Wh)

Testing procedure and testing location:			
☒	**Testing Laboratory:**	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch	
Testing location/ address .....:		No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China 518057	
☐	**Associated Testing Laboratory:**	N/A	
Testing location/ address .....:			
Tested by (name + signature) .....:		Sara Wang	
Approved by (name + signature) .....:		Rocky Wang	
☐	**Testing procedure: TMP**	N/A	
Testing location/ address .....:			
Tested by (name + signature) .....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: WMT**	N/A	
Testing location/ address .....:			
Tested by (name + signature) .....:			
Witnessed by (name + signature) ....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: SMT**	N/A	
Testing location/ address .....:			
Tested by (name + signature) .....:			
Approved by (name + signature) .....:			
Supervised by (name + signature) ..:			

List of Attachments (including a total number of pages in each attachment):

Attachment 1: 1 page of Photos;

Attachment 2: 2 pages of Information for safety;

Attachment 3: 1 page of Packaging;

Attachment 4: 1 page of Product specification;

Attachment 5: 1 page of ISO9001 certificate.

Summary of testing:

The sample(s) tested complies with the requirements of IEC 62133: 2012/ EN 62133: 2013.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Remark:

1. Cell was considered and tested according to standard in this report;
2. As requested by the manufacture, charging conditions were carried out with 0,5 C_5A (0°C to 55°C) charging current to cover 0,2 C_5A (0°C to 15°C) and 0,5 C_5A (15°C to 55°C) charging conditions;
3. Clause 8.3.8 transport tests was considered in this report and tested according to UN38.3 by TMB (Test report: TR2017072001P).

Tests performed (name of test and test clause):

Specific requirements and tests (lithium systems)

☐5.2 Insulation resistance

☒8.2.1 Continuous charging at constant voltage (cells)

☐8.2.2 Moulded case stress at high ambient temperature (battery)

☒8.3.1 External short circuit (cell)

☐8.3.2 External short circuit (battery)

☒8.3.3 Free fall

☒8.3.4 Thermal abuse (cells)

☒8.3.5 Crush (cells)

☐8.3.6 Over-charging of battery

☒8.3.7 Forced discharge (cells)

☒8.3.8 Transport tests

☐8.3.9 Design evaluation – Forced internal short circuit (cells)

Testing location:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China 518057

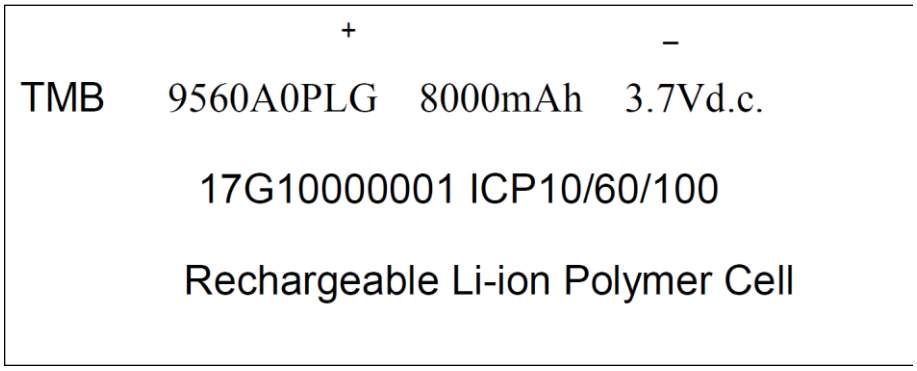
Summary of compliance with National Differences

List of countries addressed: none.

☒ **The product fulfils the requirements of EN 62133: 2013.**

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Remark:

1. '9560A0PL' is the cell model; 'G' represents the material series;
2. Manufacturing date-17G10 on the making: '17' is the year 2017; 'G' is the month from A to L represented January to December; '10' is the date.

Test item particulars:	--
Classification of installation and use:	--
Supply connection:	--
Recommend charging method declaired by the manufacturer:	CC/CV
Discharge current (0,2 I_t A):	1,6 A
Specified final voltage:	2,75 V
Chemistry:	☐ nickel systems ..... ☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell:	4,2 V
Maximum charging current:	4,0 A
Charging temperature upper limit:	55°C
Charging temperature lower limit:	0°C
Polymer cell electrolyte type:	☒ gel polymer ☐ solid polymer
Possible test case verdicts:	
- test case does not apply to the test object:	N/A
- test object does meet the requirement:	P (Pass)
- test object does not meet the requirement:	F (Fail)
Testing:	
Date of receipt of test item:	2017-07-24
Date (s) of performance of tests:	2017-07-24 to 2017-08-07

General remarks:

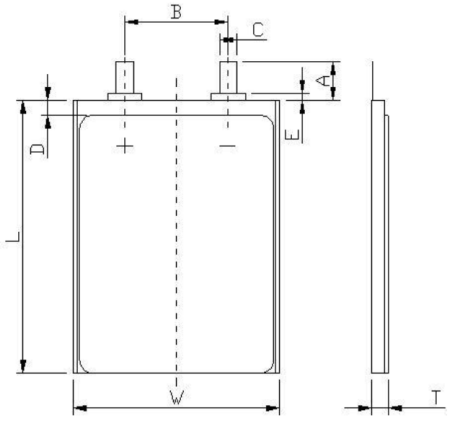
The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Name and address of factory (ies)..... : Same as applicant

General product information:

Product description:	Rechargeable Li-ion Polymer Cell
Model of cell:	9560A0PL
Designation of cell:	ICP10/60/100
Rated voltage of cell:	3,7 V
Rated capacity of cell:	8000 mAh
Maximum charge current of cell:	4000 mA



尺寸代码 Size code	尺寸项目 The size of the project	尺寸 size（mm）
T	电芯厚度（Thickness）	$9.5^{+0}_{-0.6}$
W	电芯宽度（Width）	$60.0^{+0}_{-1.5}$
L	电芯高度(Length)	$100.0^{+0}_{-1.5}$
A	极耳外露(Tab Length)	10.0±1.0
B	极耳中心距 (Distance between center of 2 tabs)	35.0±1.0
C	极耳宽度 (Tab width)	4.0±0.2
D	顶封宽度 (Top sealing Width)	3.0±0.5
E	极耳胶外露（Sealant Length)	0.5~2.0

IEC 62133			
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/A
	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		N/A
	Insulation resistance (MΩ) ..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N/A
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		N/A
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N/A
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	Cell: Seal the seam around the aluminium foil as the venting mechanism.	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/A
5.4	Temperature/voltage/current management		N/A
	Batteries are designed such that abnormal temperature rise conditions are prevented		N/A
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		N/A
	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/A
5.5	Terminal contacts		N/A
	Terminals have a clear polarity marking on the external surface of the battery		N/A
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		N/A
	Terminal contacts are arranged to minimize the risk of short circuits		N/A
5.6	Assembly of cells into batteries		N/A
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/A
	Each battery has an independent control and protection		N/A
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N/A
	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/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		N/A
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N/A
5.6.2	Design recommendation for lithium systems only		N/A
	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		N/A
	- 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/A
	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/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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/A
	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/A
	- 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/A
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	ISO 9001 certificate was submitted. See Attachment 5 for detail.	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	Tests are performed according to specified in table 2 of the standard The cell samples are not more than 6 months old (all of them were produced at 2017-07). See marking plate.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	The tests are conducted in an ambient of 20°C ± 5°C.	P
7	**Specific requirements and tests (nickel systems)**		N/A
7.1	Charging procedure for test purposes	Lithium systems	N/A
7.2	Intended use		N/A
7.2.1	Continuous low-rate charging (cells)		N/A
	Results: No fire. No explosion		N/A
7.2.2	Vibration		N/A
	Results: No fire. No explosion. No leakage		N/A
7.2.3	Moulded case stress at high ambient temperature		N/A
	Oven temperature (°C) ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A
7.2.4	Temperature cycling		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3	Reasonably foreseeable misuse		N/A
7.3.1	Incorrect installation cell		N/A
	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
	- A stabilized dc power supply.		N/A
	Results: No fire. No explosion..... :		N/A
7.3.2	External short circuit		N/A
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	Results: No fire. No explosion..... :		N/A
7.3.3	Free fall		N/A
	Results: No fire. No explosion.		N/A
7.3.4	Mechanical shock (crash hazard)		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3.5	Thermal abuse		N/A
	Oven temperature (°C)..... :		—
	Results: No fire. No explosion.		N/A
7.3.6	Crushing of cells		N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N/A
	Results: No fire. No explosion..... :		N/A
7.3.7	Low pressure		N/A
	Chamber pressure (kPa)..... :		—
	Results: No fire. No explosion. No leakage.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.8	Overcharge		N/A
	Results: No fire. No explosion..... :		N/A
7.3.9	Forced discharge		N/A
	Results: No fire. No explosion..... :		N/A
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	The upper charging temperature is 60°C The lower charging temperature is -5°C	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :	See the test result.	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	The upper limit charging voltage is 4,25 V during test.	N/A
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :		N/A
8.2	Intended use		P
8.2.1	Continuous charging at constant voltage (cells)		P
	Results: No fire. No explosion..... :	(See Table 8.2.1)	P
8.2.2	Moulded case stress at high ambient temperature (battery)		N/A
	Oven temperature (°C)..... :		—
	Results: No physical distortion of the battery case resulting in exposure of internal components		N/A
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/A
	- The case temperature declined by 20% of the maximum temperature rise		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion..... :	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)		N/A
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	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/A
	Results: No fire. No explosion..... :		N/A
8.3.3	Free fall		P
	Results: 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		P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N/A
	Oven temperature (°C)..... :	130°C	—
	Gross mass of cell (g) ..... :	125,2 g	—
	Results: No fire. No explosion.		P
8.3.5	Crush (cells)		P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	- 10% of deformation has occurred compared to the initial dimension		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.5)	P
8.3.6	Over-charging of battery		N/A
	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/A
	- Returned to ambient		N/A
	Results: No fire. No explosion..... :		N/A
8.3.7	Forced discharge (cells)		P
	Results: No fire. No explosion..... :	(See Table 8.3.7)	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.8	Transport tests		P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods	EUT was tested according to UN38.3 by TMB (Test report: TR2017072001P).	P
8.3.9	Design evaluation – Forced internal short circuit (cells)	Li-polymer cell	N/A
	The cells complied with national requirement for .....:		—
	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		N/A
	Results: No fire .....:		N/A
9	**Information for safety**		P
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	See Attachment 4 for detail.	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/A
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user .....:	Not for end user	N/A
10	**Marking**		P
10.1	Cell marking	See marking plate for detail.	P
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.		P
10.2	Battery marking		N/A
	Batteries marked in accordance with the requirements for the cells from which they are assembled.		N/A
	Batteries marked with an appropriate caution statement.		N/A
10.3	Other information		N/A
	Storage and disposal instructions marked on or supplied with the battery.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Recommended charging instructions marked on or supplied with the battery.		N/A
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.	See Attachment 3 for detail.	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		P
A.3	Consideration on charging voltage		P
A.3.1	General		P
A.3.2	Upper limit charging voltage		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	The upper limit charging voltage is 4,25 V during test.	N/A
A.4	Consideration of temperature and charging current		P
A.4.1	General		P
A.4.2	Recommended temperature range		P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	The recommended temperature range: 0°C to 55°C in specification.	P
A.4.3	High temperature range	The upper charging temperature is 60°C	P
A.4.3.1	General		P
A.4.3.2	Explanation of safety viewpoint		P
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N/A
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range	The cells charged at 60°C by the methods specified in 8.2 to 8.3	P
A.4.4	Low temperature range	The lower charging temperature is -5°C	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P

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Clause	Requirement + Test	Result - Remark	Verdict
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	The cells charged at -5°C by the methods specified in 8.2 to 8.3	P
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		N/A
A.5.1	General		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short		N/A
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		N/A
A.5.3	Disassembly of charged cell		N/A
A.5.4	Shape of nickel particle		N/A
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				P
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity [1)]**
Cell	ZHONGSHAN TIANMAO BATTERY CO., LTD.	9560A0PL	3,7 Vd.c., 8000 mAh	IEC62133:2012 EN62133:2013	Tested with appliance
- Electrolyte	Shenzhen Capchem Technology Co., Ltd.	LBC3068G2	$LiPF_6$/Dimethyl carbonate / Ethyl acetate / Ethylene carbonate	--	--
- Separator	SHENZHEN SENIOR TECHNOLOGY MATERIAL CO., LTD.	SD216102	16um PP	--	--
- Anode	Shanghai Shanshan Science & Technology Co., Ltd.	K02	Graphite	--	--
- Cathode	GEJIU SUPERHOO INDUSTRIES CO., LTD.	SS-N532A	$Li(NiCoMn)O_2$	--	--

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance.

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.1	TABLE: Continuous low rate charge (cells)		N/A
7.2.2	TABLE: Vibration		N/A
7.3.1	TABLE: Incorrect installation (cells)		N/A
7.3.2	TABLE: External short circuit		N/A
7.3.6	TABLE: Crush		N/A
7.3.8	TABLE: Overcharge		N/A
7.3.9	TABLE: Forced discharge (cells)		N/A

8.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Model	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**
Cell: 9560A0PL (#1)	4,2	4,0	4,192	Pass
Cell: 9560A0PL (#2)	4,2	4,0	4,193	Pass
Cell: 9560A0PL (#3)	4,2	4,0	4,192	Pass
Cell: 9560A0PL (#4)	4,2	4,0	4,194	Pass
Cell: 9560A0PL (#5)	4,2	4,0	4,192	Pass

Supplementary information:

- No fire or explosion
- No leakage

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TABLE: External short circuit (cell)					P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Samples charged at charging temperature upper limit[1)]					
Cell: 9560A0PL (#6)	23,1	4,191	0,087	111,71	Pass
Cell: 9560A0PL (#7)	23,1	4,193	0,088	112,69	Pass
Cell: 9560A0PL (#8)	23,1	4,194	0,092	106,76	Pass
Cell: 9560A0PL (#9)	23,1	4,196	0,087	114,69	Pass
Cell: 9560A0PL (#10)	23,1	4,194	0,083	116,45	Pass
Samples charged at charging temperature lower limit[2)]					
Cell: 9560A0PL (#11)	24,3	4,140	0,082	84,181	Pass
Cell: 9560A0PL (#12)	24,3	4,138	0,091	114,75	Pass
Cell: 9560A0PL (#13)	24,3	4,138	0,090	112,33	Pass
Cell: 9560A0PL (#14)	24,3	4,141	0,088	106,84	Pass
Cell: 9560A0PL (#15)	24,3	4,137	0,089	88,54	Pass

Supplementary information:

- No fire or explosion

[1)] Cells charged at 60°C by using 4,25 V and 4000 mA until the charging current reduced to 400 mA;

[2)] Cells charged at -5°C by using 4,25 V and 4000 mA until the charging current reduced to 400 mA.

8.3.2	TABLE: External short circuit (battery)					N/A
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Samples charged at charging temperature upper limit					
--	--	--	--	--	--
Samples charged at charging temperature lower limit					
--	--	--	--	--	--

Supplementary information:

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IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TABLE: Crush					P
Model	**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**	
Samples charged at charging temperature upper limit[1)]						
Cell: 9560A0PL (#29)	4,188	4,186	--	--	Pass	
Cell: 9560A0PL (#30)	4,187	4,185	--	--	Pass	
Cell: 9560A0PL (#31)	4,192	4,191	--	--	Pass	
Cell: 9560A0PL (#32)	4,194	4,192	--	--	Pass	
Cell: 9560A0PL (#33)	4,191	4,189	--	--	Pass	
Samples charged at charging temperature lower limit[2)]						
Cell: 9560A0PL (#34)	4,144	4,143	--	--	Pass	
Cell: 9560A0PL (#35)	4,141	4,140	--	--	Pass	
Cell: 9560A0PL (#36)	4,142	4,141	--	--	Pass	
Cell: 9560A0PL (#37)	4,142	4,141	--	--	Pass	
Cell: 9560A0PL (#38)	4,141	4,140	--	--	Pass	

Supplementary information:

- No fire or explosion
- The maximum force of 13 kN ± 1 kN has been applied, the force was released.

[1)] Cells charged at 60°C by using 4,25 V and 4000 mA until the charging current reduced to 400 mA;
[2)] Cells charged at -5°C by using 4,25 V and 4000 mA until the charging current reduced to 400 mA.

8.3.6	TABLE: Over-charging of battery				N/A
Constant charging current (A) ..... :		--			—
Supply voltage (Vdc) ..... :		--			—
Model	**OCV before charging, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum outer casing temperature, (°C)**	**Results**	
--	--	--	--	--	

Supplementary information:

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IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.7	TABLE: Forced discharge (cells)	P

Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_t, (A)	Time for reversed charge, (minutes)	Results
Cell: 9560A0PL (#39)	3,396	8,0	90	Pass
Cell: 9560A0PL (#40)	3,398	8,0	90	Pass
Cell: 9560A0PL (#41)	3,391	8,0	90	Pass
Cell: 9560A0PL (#42)	3,378	8,0	90	Pass
Cell: 9560A0PL (#43)	3,374	8,0	90	Pass

Supplementary information:

- No fire or explosion

8.3.9	TABLE: Forced internal short circuit (cells)	N/A

Model	Chamber ambient, (°C)	OCV at start of test, (Vdc)	Particle location [1)]	Maximum applied pressure, (N)	Results
--	--	--	--	--	--

Supplementary information:

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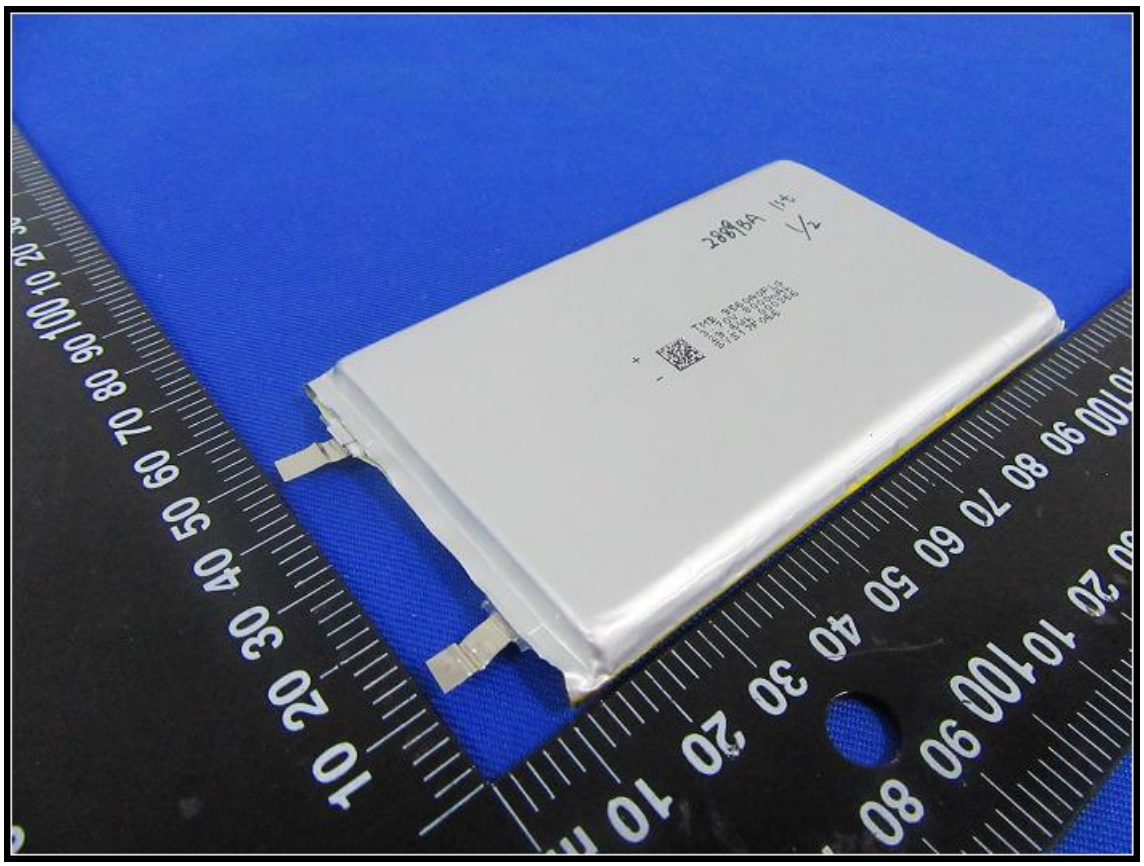
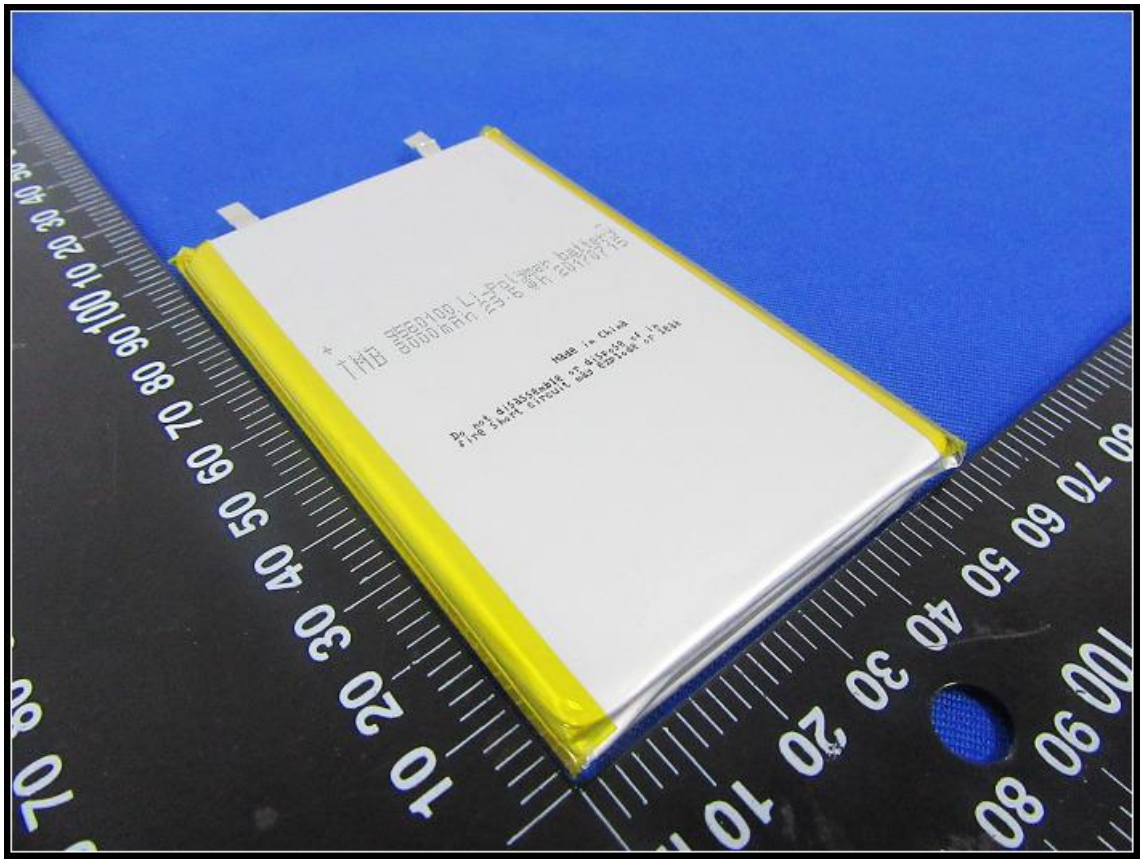
---End report---

Attachment 1 Photo documentation

Cell





- - - End of Attachment 1 - - -

Attachment 2 Information for safety

10、包装、储存及运输 Packing\Storage \shipment

10.1 电芯的包装应干燥防潮、防尘、防震、防日晒、防水。

The package of the cell should be dry and moisture proof、dust proof、shock proof、anti-sunburn、water proof.

10.2 电芯应储存在清洁干燥通风的环境中，避免与腐蚀性物质接触，应远离火源及热源。

The cell should be stored in low humidity, no corrosive material area and keep away from fire (or heat source).

10.3 运输过程中，电芯处于半充电（40%-50%）状态，避免电芯处在剧烈振动、日晒、潮湿环境。

During transportation, the cells should be in partial charged(40-50%) state and should kept away from environment of vibration、solarization、moisture.

11、保质期限 Guarantee Period of Quality

保质期限为电芯自出厂日期开始算起后的 12 个月。

The guarantee period of quality extends for 12 months after sale.

12、警告及注意事项 Warning and Attention

为了防止电芯出现泄漏、发热 、过热、着火、或影响性能、爆炸等事故，请按如下操作规定正常使用电芯，并遵守防范事项。对因没有按本规格书规定操作而导致的意外，中山天贸电芯有限公司将不负责任。

To assure product safety, describe the following precautions in the instruction manual of the application. Any misuse may cause the accident of leakage, heat、over-heat、burning out、performance effecting or explosion, TianMao Battery Co.，Ltd will not be responsible for any accident which occurred due to mishandling (ignoring of the precautions set in this specification).

12.1 在充电时，请在规定条件下用指定的充电器。

When charging the cell, use designated charger and follow the specified conditions.

12.2 不要将电芯侵入水或液体中，注意防潮。

Do not immerse cell into water or liquid, keep the cell away from moisture.

12.3 不要将电芯接近热源，如火或发热器。

Do not let the cell be closed to heat source, for example fire or heater.

12.4 不要用其他金属短路电芯的正负极。

Do not short circuit the (+) and (-) terminals with other metals.

12.5 不要拆卸电芯，拆卸电芯可能会使内部短路，进而引起内部物质分解，起火，爆炸等。此外拆卸电芯可能会使电芯内部电解液外露，而电芯内电解液对人体有害；如果有电解液溅到皮肤，眼睛或身体的其他部位，请立即用清水冲洗，且马上去看医生。

Do not disassemble the cell, otherwise it will lead to short-circuit (or decomposition, fire, explosion). The leak-out electrolyte will cause the skin uncomfortable. If it drops into the eyes or other part of body, please wash in time, and go to hospital for treatment.

Attachment 2 Information for safety

12.6 不要使电芯短路，否则大电流放电，产生热量，进而造成电解液外露、内部物资分解、爆炸等危险。

Short-circuit is forbidden, if the cell is short-circuit, it carries magnified current, which will cause heat and make the cell leakage, breaking up or explosion.

12.7 不要用火处理废弃电芯，否则会产生爆炸等危险事故。

Well dispose the disused cell, do not treat it with fire, otherwise it will lead to explode.

12.8 如果出现电芯被损坏、电芯变形、电解液泄露或闻到有电解液的味道以及其他不正常现象，不要再使用该电芯；另外，泄露电解液的电芯远离火源，避免引起爆炸。

Do not use the cell if you find it in unusual conditions such as damage, leakage (or odors).The cell should be kept away from fire to avoid an explosion.

12.9 禁止在高温下(直接在阳光下或很热的汽车中)使用或放置,电芯过热会导致起火或功能失效,寿命减短。

Do not use or leave the cell at high temperature (for example at strong direct sunlight or in a vehicle extremely hot weather) , otherwise it cause over-heating ,or fire, and weaken its performance and cycle life.

12.10 禁止在强静电和强磁场的地方使用,否则易破坏电芯安全保护装置,带来不安全隐患。

Do not use cell in strong electrostatic and magnetic field for it is easily destroyed the circuit board so that it may unsafe.

12.11 如果电芯发出异味,发热,变色或在使用、贮存、充电过程中出现任何异常现象，立即将电芯从装置或充电器中移离并停用。

If the cell give off strange odor ,generates heat, becomes discolored and deformed, or in any way being abnormal during use, immediately remove it from the device or cell charger and stop use it.

12.12 电芯更换 Cell Replacement

应由电芯或电器供应方来更换安装电芯，使用者不得擅自更换。

Do not replace cell by yourself, the cell shall be replaced by the supplier.

13、包装电芯上的标示 Signs On The Cell Package

以下警告应注明在包装后的电芯上:

All the cautions should be written on the packed cell as the the following:

使用规定的充电器

Use the specified charger.

不要将电芯投入火中或加热

Do not throw the cell into fire or heat it.

不要将电芯两端短路

Do not short circuit the (+) and (-) terminals.

不要将电芯分解拆散

Do not disassemble or modify the cell.

— When disposing of secondary cells or batteries, keep cells or batteries of different electrochemical systems separate from each other.(电池处置信息)

**********End of Attachment 2**********

Attachment 3 Packaging

**********End of Attachment 3**********

Attachment 4 Product specification

项目 Items	标准 Specification	备注 Remarks
标称容量 Nominal Capacity	8000mAh	23±2℃下 0.2 C5A 放电容量 0.2C5A Discharge Capacity at 23±2℃
标称电压 Nominal Voltage	3.7V	
出货电压 Outgoing Voltage	3.80V～4.00V	
标准（推荐）充电 Standard Charge	步骤 1：恒流充电：0.2 C5A（最大）充电至 4.2V； Step1: Constant Current: Maximum 0.2 C5A to 4.2V 步骤 2：恒压充电：4.2V；截止电流：20mA Step 2: Constant Voltage:4.2V Charge Cut-off Current: 20mA	0~15℃
	步骤 1：恒流充电：0.5C5A 充电至 4.2V； Step1:Constant Current: 0.5C5A to 4.2V 步骤 2：恒压充电：4.2V；截止电流：20mA Step2: Constant Voltage:4.2V ； Charge Cut-off Current: 20mA	15~45℃
	步骤 1：恒流充电：0.5C5A（最大）充电至 4.1V； Step1: Constant Current: Maximum 0.5C5A to 4.1 V	45℃~55℃

项目 Items	标准 Specification	备注 Remarks
最大充电电流 Maximum Charge Current	0.5 C5A 1.0 C5A	0~15℃ 15-45℃
充电截止电压 Charge Limited Voltage	4.20V	
标准（推荐）放电电流 Standard Discharge Current	0.2C5A	-20~60℃
最大放电电流 Max. continued Discharge Current	1.0C5A	0~45℃
放电截止电压 Discharge Cut-off Voltage	2.75V	
充电模式 Charging Method	恒流恒压充电模式 Constant current and constant voltage	
标称内阻 Nominal Internal Impedance	≤55mΩ	
贮存温度 Storage Temperature Range	-5~35℃	恢复容量≥80%（0.2 C5A 常温检测） 电芯应在带电 50%或电压在 3.70～ 3.8V 的状态下储存；长期贮存温度: 20±5℃ Recoverable capacity / Initial Capacity≥80% by discharge current 0.2 C5A. Storage in 50% charged state or 3.7V～3.8V at 20±5℃.
贮存湿度 Storage Humidity Range	≤75%RH	

**********End of Attachment 4**********

Attachment 5 ISO 9001 certificate

TÜV NORD

CERTIFICATE

Management system as per

GB/T 19001-2008/ ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

Zhongshan Tianmao Battery Co., Ltd.

No.208 (Tianxin Building, Tiantian Building, Tianyuan Building, MC Building and Office Building), Qianjin One Road, Xin Qianjin Village, and No.4 (A plant, D plant), Huoju Road, Tanzhou Town, Zhongshan City, Guangdong Province, P. R. China

Unified Social Credit Code: 914420007946283000

applies a management system in line with the above standard for the following scope

Design, Development and Manufacture of Lithium-ion Cells and Batteries

Certificate Registration No. 44 100 092574
Audit Report No. 2.5-7791/2016

Valid from 2016-03-08
Valid until 2018-09-14
Initial Certification 2009-12-29

Certification Body
at TÜV NORD CERT GmbH

Printing Address:
TUV NORD Hangzhou Co., Ltd.
Shanghai Branch
11F, Sail Tower, No.266 Han Kou Rd.,
Huang Pu District, Shanghai, China
200001
Issue Date: 2016-03-08

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH Langemarckstrasse 20 45141 Essen www.tuev-nord-cert.com

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-01

INTERNATIONAL IAF ACCREDITATION FORUM

Note : This certificate information can be queried at the official Website of Certification and Accreditation Administration of the People's Republic of China : www.cnca.gov.cn

GZH, FE7791, XA, 0192- Sector 2

**********End of Attachment 5**********