Prüfbericht - Nr.: CN21HY5J 001

Test Report No.:

Auftraggeber: *Client:*	SANDEN Electricity Co., Ltd. 10F., No. 8, Guosheng 5rd St., Taoyuan Dist., Taoyuan City 330, Taiwan
Gegenstand der Prüfung: *Test item:*	**Rechargeable Li-ion Cell**
Bezeichnung: *Identification:*	**See table 4 on page 5**
Serien-Nr.: *Serial No.:*	**N/A**
Wareneingangs-Nr.: *Receipt No.:*	**168315724**
Eingangsdatum: *Date of receipt:*	**2021-04-27**
Prüfort: *Testing location:*	**Shenzhen Precise Testing Technology Co., Ltd.** No. 9 Shuiku Road, Guangming New District, Shenzhen 518108, P.R. China
Prüfgrundlage: *Test specification:*	**UL 1642: 2020**
Prüfergebnis: *Test Result:*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s).*
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland (Shenzhen) Co., Ltd.** 1F East & 2-4F, Cybio Technology Building No. 1, No. 16 Kejibei 2nd Road, High-Tech Industrial Park North, Nanshan District, 518057, Shenzhen, China

geprüft/ *tested by:*

Jeffrey Qin

2021-06-10 Jeffrey Qin / Project Engineer

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

kontrolliert/ *reviewed by:*

Caroline Chen

2021-06-10 Caroline Chen / Reviewer

Datum *Date*	**Name/Stellu** *Name/Position*	**Unterschrift** *Signature*

Sonstiges/ *Other Aspects:*

TUV Rheinland TUVus mark approval procedure.
The complete test report includes the following documents:
- UL 1642 Test report (25 pages); - Attachment 1: Equipment list (1 page); - Attachment 1: Photo documents (3 pages).

Abkürzungen:				***Abbreviations:***			
	P(ass)	=	***entspricht Prüfgrundlage***		***P(ass)***	=	***passed***
	F(ail)	=	***entspricht nicht Prüfgrundlage***		***F(ail)***	=	***failed***
	N/A	=	***nicht anwendbar***		***N/A***	=	***not applicable***
	N/T	=	***nicht getestet***		***N/T***	=	***not tested***

Test item particulars:	
Information about the product needed to establish a correct test program, such as product mobility, type of power connections and similar.	(Test item particulars are selected by the TRF Originator base on the requirements in the standard)
Designation ..... :	See table 4 on page 5
Trademark ..... :	JinLu
Nominal voltage ..... :	3.2V
Rated capacity ..... :	See table 4 on page 5
Maximum charge voltage ..... :	3.65V
End discharge voltage ..... :	2.1V
Manufacturer's charge method ..... :	Charge the cell at 0.2C CC to 3.65V, then 3.65V CV until charging current reaches to 0.05C at ambient 20°C±5°C.
Utilization Type……:	Technician replaceable cell
Sample Number……:	S-21040242A0 A1#~A115# (Cell model: HK668090), S-21040242A0 B1#~B115# (Cell model: HK8080130), S-21040242A0 C1#~C115# (Cell model: HK1280130).
Possible test case verdicts:	
Test case does not apply to the test object ..... :	N/A
Test object does meet the requirement ..... :	P(ass)
Test object does not meet the requirement ..... :	F(ail)
Testing:	
Date of receipt of test item ..... :	2021-04-27
Date(s) of performance of tests ..... :	2021-04-27 to 2021-05-18

General remarks:

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

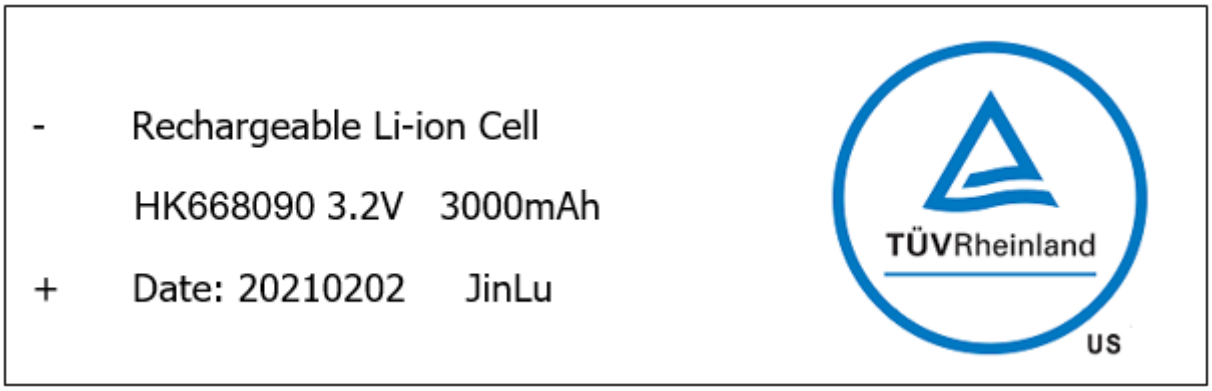
The test results presented in this report relate only to the object tested.

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

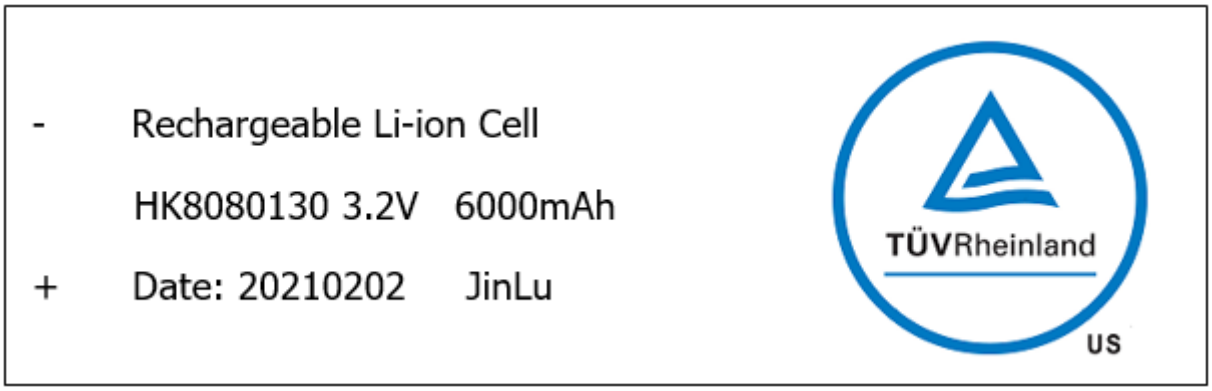
"(see appended table)" refers to a table appended to the report.

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

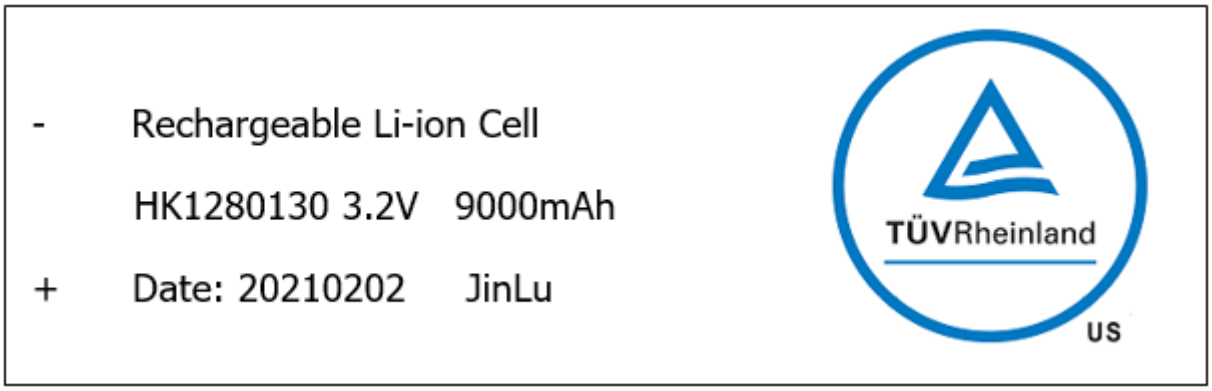
Copy of marking plate:



For cell model HK668090



For cell model HK8080130



For cell model HK1280130

Remark: These are representative labels, the labels of other models are identical to these except for the model name and rating, detail refer to table 4 on page 5.

Date code: 20210202 means date of manufacture is 2021-02-02.

Summary of testing:

The component cell is evaluated in this test report per the following test items according to UL 1642:2020.

Charging method declared by the manufacturer in specification: Charge the cell at 0.2C CC to 3.65V, then 3.65V CV until charging current reaches to 0.05C at ambient 20°C±5°C.

Test items:

cl.10 Short-Circuit Test;
cl.11 Abnormal Charging Test;
cl.13 CrushTest;
cl.14 Impact Test;
cl.15 Shock Test;
cl.16 Vibration Test;
cl.17 Heating Test;
cl.18 Temperature Cycling Test;
cl.19 Low Pressure (Altitude Simulation) Test;
cl. 20 Projectile Test.

Description of the product:

This tested sample is constructed with only one Li-ion Cell and doesn't have any short-circuits proof circuit.

1) These tested cells have not been evaluated in combination with charger(s) or host product(s). Additional evaluation to determine compliance may be required on the combination(s) in the end product evaluation.

2) The tested cells were evaluated for a maximum charge current and maximum voltage limit outlined in the Table below. The end product evaluation shall ensure that current and voltage limits noted are maintained.

3) The tested cells shall be fixed in a case with sufficient protective strength as mechanical enclosure and fire enclosure. The end product shall be kept away from fire and high temperature area.

4) The four models (Model name: HK668090, HK978090, HK8080130, HK1280130) are identical (same shape, same chemical system, using same material), except for the model name and the capacity, The tested models HK668090, HK8080130 and HK1280130 are representatives of all models.

5) The charging temperature is 2°C~45°C and the discharging temperature is 2°C~60°C.

- Table 1: Electrical parameter of model HK668090:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
HK668090	3000mAh	3.2V	600mA	600mA	3000mA	75000mA	3.65V	2.1V

- Table 2: Electrical parameter of model HK8080130:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
HK8080130	6000mAh	3.2V	1200mA	1200mA	6000mA	150000 mA	3.65V	2.1V

- Table 3: Electrical parameter of model HK1280130:

Model	Nominal capacity	Nominal voltage	Nominal Charge current	Nominal discharge current	Max. charge current	Max. discharge current	Max. charge voltage	End discharge voltage
HK1280130	9000mAh	3.2V	1800mA	1800mA	9000mA	225000 mA	3.65V	2.1V

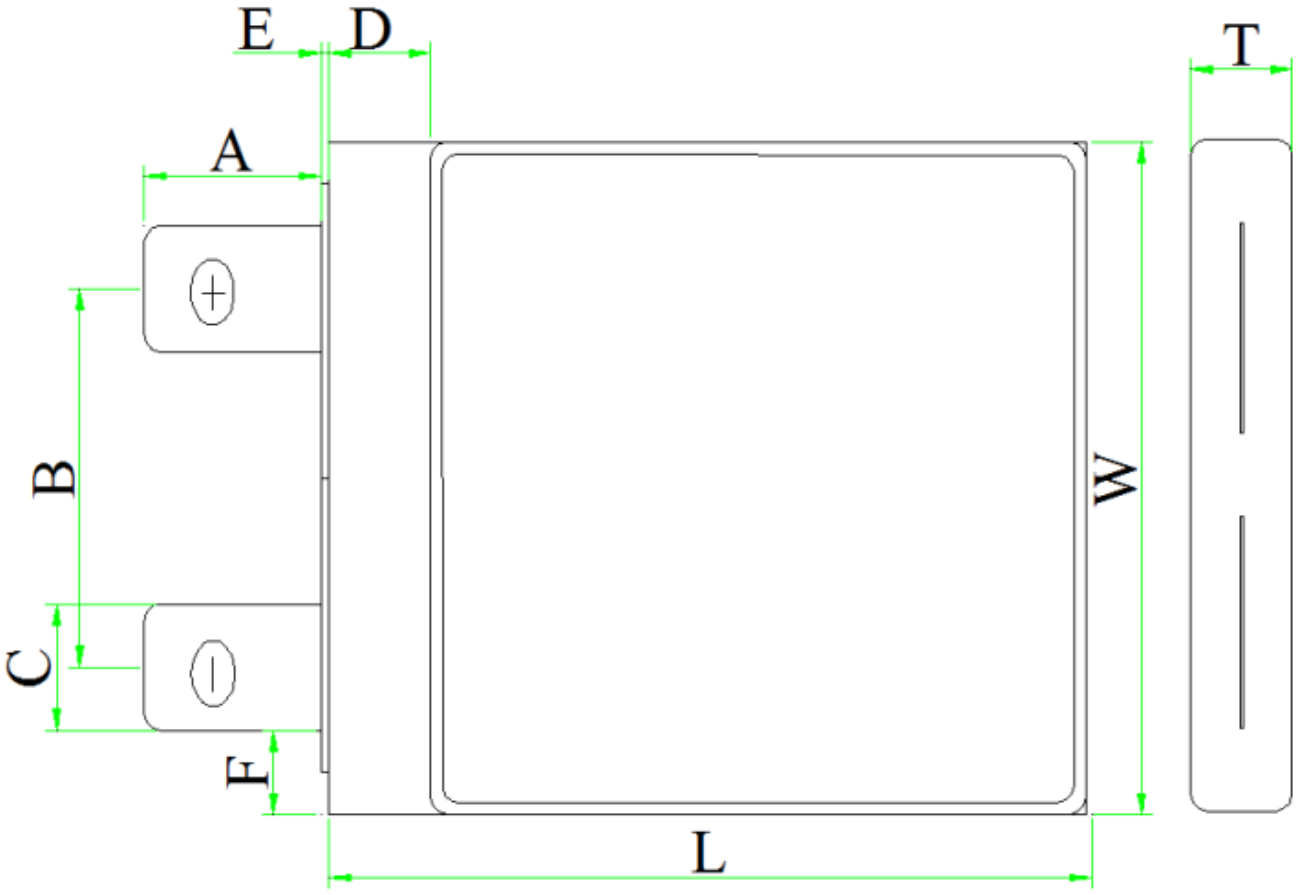
Remark: other models feature, see Table 4.

- Table 4: All of the models:

Model	Energy density (Wh/L)	Capacity (mAh)	Max. Thickness (mm)	Max. Width (mm)	Max. Length (mm)	Nominal charge current (mA)	Nominal discharge current (mA)	Max. charge current (mA)	Max. discharge current (mA)
HK668090	631.3	3000	6.6	80.0	90.0	600	600	3000	75000
HK978090	715.9	5000	9.7	80.0	90.0	1000	1000	5000	125000
HK8080130	721.2	6000	8.0	80.0	130.0	1200	1200	6000	150000
HK1280130	721.2	9000	12.0	80.0	130.0	1800	1800	9000	225000

Note: All the models have the same nominal voltage 3.2V and the same end discharge voltage 2.1V, and have the same Max. charge voltage 3.65V.

Construction:



Cell (Dimensions refer to Table 4)

Factory location :

DONGGUAN JIN LU BATTERY TECHNOLOGY CO., LTD.

15# Rome Road Qingxi Town, Dongguan City, Guangdong, P.R. China

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
INTRODUCTION			
1	**Scope**		P
2	**General**		P
3	**Glossary**		P
CONSTRUCTION			
4	**General**		N/A
4.1	**Casing**		N/A
4.1.1	The casing of a lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected, without resulting in a risk of fire. The casing of a user-replaceable lithium battery shall have the strength and rigidity necessary to resist the abuses to which it may be subjected without resulting in a risk of injury to persons.	Technician-replaceable cell	N/A
4.1.2	A cell of a user-replaceable battery shall be in a rigid casing of sufficient strength to prevent flexing. A tool providing the mechanical advantage of a pliers, screwdriver, or hacksaw shall be the minimum capable of opening the user-replaceable cell casing, if opening of the casing will expose metallic lithium.	Technician-replaceable cell	N/A
4.2	**Electrolyte**		N/A
4.2.1	A user-replaceable battery shall not contain pressurized vapor or liquid that could spray materials into the eyes or leak more than 5 milliliters of liquid when the battery casing is punctured under normal laboratory conditions, 23 ±2°C (73 ±3.6°F).	Technician-replaceable cell	N/A
4.3	**Use**		N/A
4.3.1	A lithium battery shall be protected from abnormal charging currents during use. A battery tested and found acceptable for the charging current, I_C (see Section 11), under fault conditions specified by the manufacturer, shall be protected from larger charging currents in the end product application by: a) Two blocking components, such as diodes, or b) One blocking component and one current limiting component, such as a resistor or a fuse. The current limiting component shall limit the charging current to one-third the value used in the Abnormal Charging Test, Section 11.	Cell only	N/A
PERFORMANCE			
5	**General**		P
5.1	**Technician-replaceable Batteries**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.1	Technician-replaceable lithium cells or batteries are to be tested as described in Sections 10 – 20. Section 12, Forced-Discharge Test, is applicable only to cells intended to be used in series-connected multicell applications such as battery packs. For multicell installations, also see 5.3.1.		P
5.1.2	When a fire or explosion occurs as a result of the Crush Test, Section 13, or the Impact Test, Section 14, or the cell or battery ruptures to the extent that the aluminum test cage is penetrated during the Projectile Test, Section 20; the use of the technician replaceable cell or battery shall be restricted to applications in which it is not exposed to, or is protected from, any conditions shown to cause a fire or explosion.	No fire or explosion occurs	P
5.1.3	Cells and batteries subjected to the Shock Test, Section 15, Vibration Test, Section 16, Temperature Cycling Test, Section 18, and Low Pressure (Altitude Simulation) Test, Section 19, shall also not leak or vent. For these tests, unacceptable leakage is determined to have occurred when the resulting mass loss exceeds the values shown in Table 5.1, Venting and leakage mass loss criteria.	No leak or vent	P
5.2	**User-replaceable Batteries**		N/A
5.2.1	User-replaceable lithium cells or batteries are to be tested as described in Sections 10-20. Section 12, Forced Discharge Test, is applicable only to cells intended to be used in multicell applications such as battery packs. In addition to complying with the requirements for a technician replaceable cell or battery as specified in 5.1.1, a user-replaceable cell or battery shall not explode or ignite when subjected to the Crush Test, Section 13, or the Impact Test, Section14.	Technician-replaceable Cell	N/A
5.2.2	Sets of five specimens each are to be used for the Projectile Test, Section 20.3; see Table 6.3. When only one specimen from a set of five does not comply with the requirements, another set of five specimens is to be tested. All specimens from this second set shall comply with the requirements.	Technician-replaceable Cell	N/A
5.3	**Multi-cell Installation**		N/A
5.3.1	A technician-replaceable or user-replaceable cell intended for use in multicell installations or battery packs shall also be tested as described in 10.3 and Section 12. No fire or explosion shall occur as a result of these tests. In addition, batteries subjected to the test described in 10.3 shall meet the requirements as described in 5.1.1 and 5.2.1 for a cell or battery subjected to the Short-Circuit Test, Section10.	Single cell	N/A
6	**Samples**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
6.1	Fully charged primary cells or batteries and primary cells or batteries that have been conditioned by partial or complete discharge, or both, are to be used for the tests described in Sections 10-20. The number of samples to be used in each test for a primary technician-replaceable cell or battery is shown in Table 6.1. The number of samples to be used in each test for a primary user-replaceable cell or battery is shown in Table 6.3. When a group of cells or batteries of different sizes, but similar chemistries is involved, selected sizes representative of the range are to be tested.	The samples are Rechargeable Li-ion Cell.	N/A
6.2	Fully charged secondary cells or batteries and secondary cells or batteries that have been conditioned by charge-discharge cycling are to be used for the tests described in Sections 10 – 20. The number of samples to be used in each test for a secondary technician-replaceable cell or battery is shown in Table 6.2. The number of samples to be used in each test for a secondary user-replaceable cell or battery is shown in Table 6.4. When a group of cells or batteries of different sizes, and similar chemistries is involved, selected sizes representative of the range are to be tested.	Prepared as required.	P
6.3	Prior to conducting the testing in Section 17, the lithium ion cell samples shall be pre-conditioned as outlined in 6.4 and 6.5.	Prepared as required.	P
6.4	For the heating test of Section 17, two sets of five lithium ion cell samples are to be fully discharged (i.e. to the manufacturer's specified end point voltage). The samples are then placed in a test chamber and conditioned for 1 to 4 h (5 samples at the upper temperature limit and 5 samples at the lower temperature limit of the operating region) as outlined in Table 6.3.	Prepared as required.	P
6.5	While still in the test chamber set at the temperature limits, the samples are charged (5 samples at the upper temperature limit and 5 samples at lower temperature limit) at the specified maximum charging current and upper limit charging voltage per Table 6.3, using a constant voltage charging method. Charging is continued until the charge current is reduced to the specified end of charge conditions (i.e. 0.05 times the charge current).	Prepared as required.	P
7	**Conditioning of Samples**		P
7.1	**Discharge**		N/A

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.1	Primary batteries are to be completely discharged by connecting their terminals through resistors that provide the desired level of discharge within 60 days. Completely discharged is considered to be the state in which the closed-circuit voltage has been reduced to less than 0.2 volts and the short-circuit current to less than 1.0 milliamperes. Batteries are to be discharged at room temperature. Cells with a liquid cathode such as thionyl chloride or sulfur dioxide, shall also be conditioned by one-half discharge	The samples are Rechargeable Li-ion Cell.	N/A
7.1.2	For solid electrolyte and other types of primary lithium batteries that cannot be discharged within 60 days because of the small currents they inherently produce, longer discharge times plus discharge at higher temperatures may be used to obtain the desired level of discharge. The manufacturer's recommended discharge procedures are to be followed so as to obtain the required discharge level in the minimum time.	The samples are Rechargeable Li-ion Cell.	N/A
7.2	**Charge-discharge cycling**		P
7.2.1	Secondary cells are to be conditioned at 25°C (77°F). Cells are continuously cycled as per the manufacturer's specifications. The specification shall be such that the full rated capacity of the cell is utilized and the number of cycles accumulated shall be at least equal to 25 percent of the advertised cycle life of the cell or cycled continuously for 90 days, whichever is shorter. Cycling is to be done either individually or in groups. Cells are to be recharged prior to testing as indicated in Table 6.2 and Table 6.4.	The samples are cycled at manufacturer's factory before they were sent for test.	P
8	**Important test considerations**		P
8.1	Some lithium batteries are capable of exploding when the tests described in Sections 10-20 are conducted. It is important that personnel be protected from the flying fragments, explosive force, sudden release of heat, and noise that results from such explosions. The test area is to be well ventilated to protect personnel from possible harmful fumes or gases.	Prepared the tests as required.	P
8.2	As an additional precaution, the temperatures on the surface of the battery casings shall be monitored during the tests described in Sections 10, 12, 13, and 14. All personnel involved in the testing of lithium batteries are to be instructed never to approach a lithium battery while the surface temperature exceeds 90°C (194°F).	Prepared the tests as required.	P
8.3	For protection, the Projectile Test, Section 20 is to be conducted in a room separate from the observer.	Prepared the tests as required.	P
9	**Temperature measurements**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
9.1	Temperatures are to be measured by thermocouples consisting of wires not larger than 24 AWG (0.21 mm2) and not smaller than 30 AWG (0.05 mm2) and a potentiometer-type instrument.	Prepared the tests as required.	P
9.2	The temperature measurements on the batteries are to be made with the measuring junction of the thermocouple held tightly against the metal casing of the battery.	Prepared the tests as required.	P
TESTS FOR TECHNICIAN-REPLACEABLE AND USER-REPLACEABLE BATTERIES			
ELECTRICAL TESTS			
10	**Short-Circuit Test**		P
10.1	Each test sample battery, in turn, is to be short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a maximum resistance load of *0.1* ohm. The battery is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.1 volts and the battery case temperature has returned to ±10°C (±18°F) of ambient temperature.	Tested as required. See table 10.	P
10.2	Tests are to be conducted at 20 ±5°C (68 ±9°F) and at 55 ±5°C (131 ±9°F). The batteries are to reach equilibrium at 20 ±5°C or 55 ±5°C, as applicable, before the terminals are connected.	Tested as required.	P
10.3	A battery is to be tested individually unless the manufacturer indicates that it is intended for use in series or parallel. For series or parallel use, additional tests on five sets of batteries are to be conducted using the maximum number of batteries to be covered for each configuration.	Tested as required.	P
10.4	When an overcurrent or thermal protective device that has been investigated for the purpose actuates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. A protective device that has not been investigated for the purpose shall be short-circuited.		N/A
10.5	The samples shall not explode or catch fire. The temperature of the exterior cell or battery casing shall not exceed 150°C (302°F).	The test results meet the requirements.	P
11	**Abnormal Charging Test**		P
11.1	Primary cells or batteries shall comply with 11.2—11.7.	Secondary cell	N/A
11.2	Cells or batteries conditioned in accordance with Tables 6.1 or 6.3, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of 20 ±5°C (68 ±9°F).		N/A

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.3	Each test sample battery is to be subjected to a charging current of three times the current I, specified by the manufacturer by connecting it in opposition to a dc-power supply. The specified charging current is to be obtained by connecting a resistor of the specified size and rating in series with the battery. The test charging time is to be calculated using the formula: $t_c = \frac{2.5C}{3(I_c)}$, in which ***$t_c$*** *is the charging time in hour* ***C*** *is the capacity of the cell/batteiy in ampere-hours, and* ***I_c*** *is the maximum charging current, in amperes, specified by the manufacturer.* The minimum charging time is to be 7 hours.		N/A
11.4	When a non-resettable overcurrent or thermal protective device that has been investigated for the purpose operates during the test, the test is to be repeated at a charge current below the level that the protective device operates. When a resettable protective device operates during the test, the protector is allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. A protective device that has not been investigated for the purpose is to be short-circuited. See 2.3.2.		N/A
11.5	The samples shall not explode or catch fire.		N/A
11.6	Secondary cells or batteries shall comply with 11.7—11.10.	Tested as required, see table 11.	P
11.7	Cells or batteries conditioned in accordance with Tables 6.2 or 6.4, as applicable, are to be used for this test. The batteries are to be tested in an ambient temperature of 20 ±5°C (68 ±9°F).	Tested as required.	P
11.8	Each test sample battery is to be discharged at a constant current of 0.2c/Ihour, to a manufacturer specified discharge endpoint voltage. The cell or battery is then to be charged with a constant maximum specified output voltage and a current limit of three times the maximum charging current, I, specified by the manufacturer. Charging duration is to be 7 hours or the time required to reach the manufacturer's specified end-of-charge condition, whichever is greater.	Tested as required.	P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
11.9	The cell/battery is to be tested without the assistance of overcurrent or thermal protective devices, unless such protective devices have been investigated for the purpose. When a non-resettable overcurrent or thermal protective device operates during the test, the test shall be repeated at an overcharging current below the level that the protection device operates. When a resettable protective device operates during the test, the protector is to be allowed to reset to a total of 10 cycles; or until the appropriate charging time has been completed, but not less than 7 hours. A protective device that has not been investigated for the purpose is to be short-circuited. See 2.3.2.		P
11.10	The samples shall not explode or catch fire.	No explosion or fire during and after the test.	P
12	**Forced-Discharged Test**		N/A
12.1	This test is intended for cells that are to be used in series-connected, multicell applications, such as battery packs.	single cell	N/A
12.2	A completely discharged cell is to be force-discharged by connecting it in series with fully charged cells of the same kind. The number of fully charged cells to be connected in series with the discharged cell is to equal the maximum number less one of the cells to be covered for series use. Five cells are to be completely discharged, at room temperature.		N/A
12.3	Once the completely discharged cell is connected in series with the specified number of fully charged cells the resultant battery pack is to be short circuited.		N/A
12.4	The positive and negative terminals of the sample are to be connected with a copper wire with a maximum resistance load of 0.1 ohm. The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2 volts and the battery case temperature has returned to ±10°C (18°F) of ambient temperature.		N/A
12.5	When an overcurrent or thermal protective device that has been investigated for the purpose operates during the test, the test shall be repeated with the battery supply connected to the maximum load that does not cause the protective device to open. A protective device that has not been investigated for the purpose shall be short-circuited.		N/A
12.6	The samples shall not explode or catch fire.		N/A
MECHANICAL TESTS			
13	**Crush Test**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
13.1	A battery is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells and the crushing is to be continued until an applied force of 13 ±1 kN (3000 ±224 lbs) is reached. Once the maximum force has been obtained it is to be released.	Tested as required. See table 13.	P
13.2	A cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides will be subjected to the crushing force. Each sample is to be subjected to a crushing force in only one direction. Separate samples are to be used for each test. Exception: For Lithium ion systems, a cylindrical, pouch or prismatic cell is to be crushed with its longitudinal axis parallel to the flat surface of the crushing apparatus. Each sample is to be subjected to a crushing force in only one direction. Test only the wide side of pouch and prismatic cells.	Lithium ion cell, tested as required.	P
13.3	A coin or button battery is to be crushed with the flat surface of the battery parallel with the flat surfaces of the crushing apparatus.		N/A
13.4	The samples shall not explode or catch fire.	No explosion or fire during and after the test	P
14	**Impact Test**		P
14.1	A test sample battery is to be placed on a flat surface. A 15.8 ±0.1-mm (5/8 ±0.004-in) diameter bar is to be placed across the center of the sample. A 9.1 ±0.46-kg (20 ±1-lb) weight is to be dropped from a height of 610 ±25 mm (24 ±1 in) onto the sample.	Prepared the test as required. See table 14.	P
14.2	A cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm (5/8-in) diameter curved surface lying across the center of the test sample. A prismatic cell is also to be rotated 90° around its longitudinal axis so that both the wide and narrow sides are subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be used for each test. Exception: For lithium ion systems, a cylindrical, pouch or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8-mm(5/8-in) diameter curved surface lying across the center of the test sample. Each sample is to be subjected to only a single impact. Test only the wide side of pouch and prismatic cells.	Lithium ion cell, tested as required.	P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
14.3	A coin or button battery is to be impacted with the flat surface of the test sample parallel to the flat surface and the 15.8-mm (5/8-in) diameter curved surface lying across its center.		N/A
14.4	The samples shall not explode or catch fire.	No explosion or fire during and after the test.	P
15	**Shock Test**		P
15.1	The cell is to be secured to the testing machine by means of a rigid mount which supports all mounting surfaces of the cell. Each cell shall be subjected to a total of three shocks of equal magnitUde. The shocks are to be applied in each of three mutually perpendicular directions unless it has only two axes of symmetry in which case only two directions shall be tested. Each shock is to be applied in a direction normal to the face of the cell. For each shock the cell is to be accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is 75 g (where g is the local acceleration due to gravity). The peak acceleration shall be between 125 and 175 g. Cells shall be tested at a temperature of 20 ± 5°C (68 ± 9°F).	Prepared the test as required. See table 15	P
15.2	The samples shall not explode or catch fire. In addition, the sample shall not vent or leak as described in 5.1.1.	No explosion or fire, the sample not vent or leak.	P
16	**Vibration Test**		P
16.1	A battery is to be subjected to simple harmonic motion with an amplitude of 0.8 mm (0.03 inch) [1.6 mm (0.06 inch) total maximum excursion].	Prepared the test as required. See table 16.	P
16.2	The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 nor more than 100 minutes. The battery is to be tested in three mutually perpendicular directions. For a battery that has only two axes of symmetry, the battery is to be tested perpendicular to each axis.	Tested as required.	P
16.3	The samples shall not explode or catch fire. In addition the sample shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
ENVIRONMENTAL TESTS			
17	**Heating Test**		P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
17.1	A battery is to be heated in a gravity convection or circulating air oven with an initial temperature of 20 ±5°C (68±9°F). The temperature of the oven is to be raised at a rate of 5 ±2°C (9±3.6°F) per minute to a temperature of 130 ±2°C (266±3.6°F) and remain for 10 min. The sample shall return to room temperature (20±5°C) and then be examined. For batteries specified for temperatures above 100°C (212°F), the conditioning temperature shall be increased from 130 ±2°C (266±3.6°F), to 30±2°C (86±3.6°F) above the manufacturers maximum specified temperature. For a battery of lithium metal chemistry, the conditioning temperature shall be increased to a maximum of 170 ±2°C (338±3.6°F).	Tested as required.	P
17.2	The samples shall not explode or catch fire.	The test results meet the requirements.	P
18	**Temperature Cycling Test**		P
18.1	The batteries are to be placed in a test chamber and subjected to the following cycles: Raising the chamber-temperature to 70 ±3°C (158 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. Reducing the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes and maintaining this temperature for 2 hours. Reducing the chamber temperature to minus 40 ±3°C (minus 40 ±5°F) within 30 minutes and maintaining this temperature for 4 hours. Raising the chamber temperature to 20 ±3°C (68 ±5°F) within 30 minutes. Repeating the sequence for a further 9 cycles. After the 10th cycle, storing the batteries for a minimum of 24 hours, at a temperature of 20 ±5°C (68 ±9°F) prior to examination.	Tested as required. See table 18.	P
18.2	The samples shall not explode or catch fire. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
19	**Low Pressure (Altitude Simulation) Test**		P
19.1	Sample batteries are to be stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a temperature of 20 ± 3°C (68 ± 5°F).	Tested as required. See table 19.	P
19.2	The samples shall not explode or catch fire as a result of the Altitude Simulation Test. In addition, the samples shall not vent or leak as described in 5.1.1.	The test results meet the requirements.	P
TESTS FOR USER-REPLACEABLE LITHIUM BATTERIES			
20	**Projectile Test**		P
20.1	When subjected to the test described in 20.2 - 20.5 no part of an exploding cell or battery shall penetrate the wire screen such that some or all of the cell or battery protrudes through the screen.	The test results meet the requirements.	P

UL1642: 2020			
Clause	Requirement + Test	Result - Remark	Verdict
20.2	Each test sample cell or battery is to be placed on a screen that covers a 102 mm (4 inch) diameter hole in the center of a platform table. The screen is to be constructed of steel wire mesh having 20 openings per inch (25.4 mm) and a wire diameter of 0.017 inch (0.43 mm).	Prepared the test as required.	P
20.3	The screen is to be mounted 38 mm (1-1/2 inch) above a meker type burner. The fuel and air flow rates are to be set to provide a bright blue flame that causes the supporting screen to glow a bright red.	Prepared the test as required.	P
20.4	An eight-sided covered wire cage, 610 mm (2 feet) across and 305 mm (1 foot) high, made from metal screening is to be placed over the test sample. See Figure 20.1. The metal screening is to be constructed from 0.25 mm (0.010 inch) diameter aluminum wire with 16 — 18 wires per inch (25.4 mm) in each direction.	Tested as required.	P
20.5	The sample is to be heated and shall remain on the screen until it explodes or the cell or battery has ignited and burned out. It is not required to secure the sample in place unless it is at risk of falling off the screen before the test is completed. When required, the sample shall be secured to the screen with a single wire tied around the sample.	Tested as required.	P
MARKING			
21	**General**		P
21.1	A battery shall be legibly and permanently marked with: The manufacturer's name, trade name, or trademark or other descriptive marking by which the organization responsible for the product may be identified; A distinctive ("catalog" or "model") number or the equivalent; The date or other dating period of manufacture not exceeding any three consecutive months.	See marking plate on page 3	P
21.2	If a manufacturer produces a battery at more than one factory, each battery package shall have a distinctive marking to identify it as the product of a particular factory.	One factory.	N/A

Critical Components					
Material: e.g. external enclosure, PCB, closed-end connector, sleeves, cord anchorage etc Components with winding: e.g. motor, transformer, magnetic coil etc. Other components: e.g. switch, thermostat, heater, plug, internal wire, capacitor, relay, varistor etc.					
Object/ Part No.	Manufacturer/ trademark	Type/ Model	Technical data	Standard	Mark(s) of conformity
Cell	DONGGUAN JIN LU BATTERY TECHNOLOGY CO., LTD.	HK668090, HK978090, HK8080130, HK1280130	HK668090: 3.2V, 3000mAh; HK978090: 3.2V, 5000mAh; HK8080130: 3.2V, 6000mAh; HK1280130: 3.2V, 9000mAh	UL 1642: 2020	Tested with appliance
-Positive electrode	Guizhou's high and new energy Technology Co. LTD	CN-01	$LiFePO_4$ Specific surface area: 13±2m^2/g, Vibration solid density: >0.6g/cm^3 Particle size D50: 2±1μm	--	--
-Negative electrode	Long Time Electronic Materials Co. LTD	LT-PW-1	Carbon Particle size D50: 8-13μm Tap density: >1.2g/cm^3 Specific surface area: ≤2m^2/g	--	--
-Separator	Dongguan CCID Electronic Technology Co. LTD	16μm	PE+Al_2O_3 , Thickness: 16μm Closed pore temperature: 140±5°C	--	--
-Electrolyte	Dongguan Shanshan Battery Material Co. LTD	SS-JSJL009	Chromaticity≤50 Moisture≤ 20ppm, Free acid≤ 50ppm $LiPF_6$+PC+EC+DMC+DEC+EMC	--	--
-Case	Suzhou First PV Materials Co., LTD	0.113mm	Thickness: 0.113mm, Aluminum plastic film	--	--

10	TABLE: Short-Circuit Test				P
Fully Charged Cell					
Ambient temperature: 24.7°C					
Sample No.	A1#	A2#	A3#	A4#	A5#
Tmax(°C)	60.2	60.6	56.0	59.6	60.4
Failure Mode	No	No	No	No	No
Ambient temperature: 24.2°C					
Sample No.	B1#	B2#	B3#	B4#	B5#
Tmax(°C)	67.9	66.5	60.4	65.3	69.3
Failure Mode	No	No	No	No	No
Ambient temperature: 24.7°C					
Sample No.	C1#	C2#	C3#	C4#	C5#
Tmax(°C)	67.1	65.2	67.5	68.8	65.8
Failure Mode	No	No	No	No	No
Ambient temperature: 57.9°C					
Sample No.	A6#	A7#	A8#	A9#	A10#
Tmax(°C)	68.0	68.4	69.2	69.8	66.5
Failure Mode	No	No	No	No	No
Ambient temperature: 56.9°C					
Sample No.	B6#	B7#	B8#	B9#	B10#
Tmax(°C)	66.4	65.0	67.3	64.6	67.6
Failure Mode	No	No	No	No	No
Ambient temperature: 56.2°C					
Sample No.	C6#	C7#	C8#	C9#	C10#
Tmax(°C)	67.1	69.3	68.7	65.0	63.9
Failure Mode	No	No	No	No	No
Cycled Cell					
Ambient temperature: 24.7°C					
Sample No.	A11#	A12#	A13#	A14#	A15#
Tmax(°C)	55.6	57.3	58.4	60.4	55.8
Failure Mode	No	No	No	No	No
Ambient temperature: 24.2°C					
Sample No.	B11#	B12#	B13#	B14#	B15#
Tmax(°C)	70.5	64.7	65.6	67.2	68.6
Failure Mode	No	No	No	No	No

Ambient temperature: 24.7°C					
Sample No.	C11#	C12#	C13#	C14#	C15#
Tmax(°C)	67.7	63.5	68.7	66.9	68.3
Failure Mode	No	No	No	No	No
Ambient temperature: 57.9°C					
Sample No.	A16#	A17#	A18#	A19#	A20#
Tmax(°C)	70.7	70.1	72.0	66.4	65.2
Failure Mode	No	No	No	No	No
Ambient temperature: 56.9°C					
Sample No.	B16#	B17#	B18#	B19#	B20#
Tmax(°C)	66.1	65.8	64.7	66.9	67.3
Failure Mode	No	No	No	No	No
Ambient temperature: 56.8°C					
Sample No.	C16#	C17#	C18#	C19#	C20#
Tmax(°C)	65.9	63.3	66.1	65.6	63.0
Failure Mode	No	No	No	No	No
Supplementary information: Tmax was recorded on the centre of the outside case. No explode or catch fire.					

11	**TABLE: Abnormal Charging Test**			**P**
Ambient temperature: 23.1°C, Cell model: HK668090				
Id	0.6 A	Ue	2.1 V	
Ic	3.0 A	Uc	3.65 V	
Fully Charged Cell				
Sample No.	A21#	A22#	A23#	A24#	A25#
Tmax(°C)	30.8	31.1	30.6	39.8	29.4
Failure Mode	No	No	No	No	No
Cycled cell					
Sample No.	A26#	A27#	A28#	A29#	A30#
Tmax(°C)	30.5	30.3	30.9	31.5	39.4
Failure Mode	No	No	No	No	No
Ambient temperature: 24.2°C, Cell model: HK8080130					
Id	1.2 A	Ue	2.1 V		
Ic	6.0 A	Uc	3.65 V		

Fully Charged Cell					
Sample No.	B21#	B22#	B23#	B24#	B25#
Tmax(°C)	40.0	36.5	38.2	43.3	45.1
Failure Mode	No	No	No	No	No
Cycled cell					
Sample No.	B26#	B27#	B28#	B29#	B30#
Tmax(°C)	37.3	38.6	37.2	37.1	44.7
Failure Mode	No	No	No	No	No

Ambient temperature: 24.3°C, Cell model: HK1280130			
Id	1.8 A	Ue	2.1 V
Ic	9.0 A	Uc	3.65 V

Fully Charged Cell					
Sample No.	C21#	C22#	C23#	C24#	C25#
Tmax(°C)	27.6	25.2	26.5	27.7	26.0
Failure Mode	No	No	No	No	No
Cycled cell					
Sample No.	C26#	C27#	C28#	C29#	C30#
Tmax(°C)	26.6	25.7	25.6	26.1	26.3
Failure Mode	No	No	No	No	No

Supplementary information:
Tmax was recorded on the centre of the outside case;
Test current is 3*Ic;
No explode or catch fire.

13	**TABLE: Crush Test**				**P**
Ambient temperature: 21.8°C					
Fully Charged Cell					
Sample No.	A31#	A32#	A33#	A34#	A35#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	B31#	B32#	B33#	B34#	B35#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	C31#	C32#	C33#	C34#	C35#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	flat surfaces	flat surfaces	flat surfaces	flat surfaces	flat surfaces
Failure mode	No	No	No	No	No

Fully Charged Cell					
Sample No.	A36#	A37#	A38#	A39#	A40#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	B36#	B37#	B38#	B39#	B40#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	C36#	C37#	C38#	C39#	C40#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Crush direction	flat surfaces	flat surfaces	flat surfaces	flat surfaces	flat surfaces
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

14	**TABLE: Impact Test**				**P**
Ambient temperature: 20.5°C					
Fully Charged Cell					
Sample No.	A41#	A42#	A43#	A44#	A45#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	B41#	B42#	B43#	B44#	B45#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	C41#	C42#	C43#	C44#	C45#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Impact direction	flat surfaces	flat surfaces	flat surfaces	flat surfaces	flat surfaces
Failure mode	No	No	No	No	No
Cycled cell					
Sample No.	A46#	A47#	A48#	A49#	A50#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	B46#	B47#	B48#	B49#	B50#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No
Sample No.	C46#	C47#	C48#	C49#	C50#
Catch fire	No	No	No	No	No
Explode	No	No	No	No	No

Impact direction	flat surfaces	flat surfaces	flat surfaces	flat surfaces	flat surfaces
Failure mode	No	No	No	No	No
Supplementary information: no explosion or catch fire.					

15	**TABLE: Shock Test**				**P**
Ambient temperature: 23.9°C					
Fully Charged Cell					
Sample No.	A51#	A52#	A53#	A54#	A55#
Mass before test (g)	81.72	80.11	79.62	79.52	80.13
Mass after test (g)	81.71	80.10	79.62	79.51	80.12
Mass loss ratio (%)	0.012	0.012	0.000	0.012	0.012
Sample No.	B51#	B52#	B53#	B54#	B55#
Mass before test (g)	156.94	157.0	155.68	158.92	160.21
Mass after test (g)	156.93	157.0	155.67	158.91	160.21
Mass loss ratio (%)	0.006	0.000	0.006	0.006	0.000
Sample No.	C51#	C52#	C53#	C54#	C55#
Mass before test (g)	230.52	231.97	227.78	233.50	233.16
Mass after test (g)	230.52	231.96	227.78	233.50	233.15
Mass loss ratio (%)	0.000	0.004	0.000	0.000	0.004
Cycled cell					
Sample No.	A56#	A57#	A58#	A59#	A60#
Mass before test (g)	79.21	80.23	81.07	79.60	79.25
Mass after test (g)	79.21	80.22	81.06	79.60	79.25
Mass loss ratio (%)	0.000	0.012	0.012	0.000	0.000
Sample No.	B56#	B57#	B58#	B59#	B60#
Mass before test (g)	158.76	155.85	157.80	156.73	157.19
Mass after test (g)	158.76	155.84	157.80	156.73	157.18
Mass loss ratio (%)	0.000	0.006	0.000	0.000	0.006
Sample No.	C56#	C57#	C58#	C59#	C60#
Mass before test (g)	228.39	233.29	231.16	231.39	230.60
Mass after test (g)	228.39	233.28	231.15	231.39	230.58
Mass loss ratio (%)	0.000	0.004	0.004	0.000	0.008
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%					

16	TABLE: Vibration Test				P
Ambient temperature: 24.3°C					
Fully Charged Cell					
Sample No.	A61#	A62#	A63#	A64#	A65#
Mass before test (g)	84.95	81.16	82.98	84.33	80.83
Mass after test (g)	84.93	81.16	82.96	84.31	80.83
Mass loss ratio (%)	0.023	0.000	0.023	0.023	0.000
Sample No.	B61#	B62#	B63#	B64#	B65#
Mass before test (g)	157.76	157.65	157.45	157.79	158.57
Mass after test (g)	157.75	157.65	157.43	157.78	158.57
Mass loss ratio (%)	0.006	0.000	0.012	0.006	0.000
Sample No.	C61#	C62#	C63#	C64#	C65#
Mass before test (g)	234.05	235.55	231.93	234.57	231.16
Mass after test (g)	234.03	235.55	231.92	234.55	231.16
Mass loss ratio (%)	0.008	0.000	0.004	0.008	0.000
Cycled cell					
Sample No.	A66#	A67#	A68#	A69#	A70#
Mass before test (g)	84.72	80.40	81.30	84.67	83.80
Mass after test (g)	84.71	80.40	81.28	84.67	83.79
Mass loss ratio (%)	0.011	0.000	0.023	0.000	0.011
Sample No.	B66#	B67#	B68#	B69#	B70#
Mass before test (g)	157.51	157.76	157.41	156.71	157.97
Mass after test (g)	157.51	157.74	157.40	156.71	157.96
Mass loss ratio (%)	0.000	0.012	0.006	0.000	0.006
Sample No.	C66#	C67#	C68#	C69#	C70#
Mass before test (g)	232.30	232.90	231.93	231.91	230.63
Mass after test (g)	232.28	232.90	231.92	231.89	230.61
Mass loss ratio (%)	0.008	0.000	0.004	0.008	0.008
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%					

18	TABLE: Temperature Cycling Test				P
Ambient temperature: 24.0°C					
Fully Charged Cell					
Sample No.	A91#	A97#	A93#	A94#	A95#
Mass before test (g)	85.64	83.67	85.34	84.12	84.35
Mass after test (g)	85.62	83.64	85.31	84.10	84.32
Mass loss ratio (%)	0.023	0.035	0.035	0.023	0.035

Sample No.	B91#	B92#	B93#	B94#	B95#
Mass before test (g)	157.85	156.92	156.74	157.14	158.92
Mass after test (g)	157.82	156.90	156.72	157.10	158.89
Mass loss ratio (%)	0.019	0.012	0.012	0.025	0.018
Sample No.	C91#	C92#	C93#	C94#	C95#
Mass before test (g)	231.27	227.94	231.12	235.46	231.79
Mass after test (g)	231.23	227.91	231.09	235.44	231.75
Mass loss ratio (%)	0.017	0.013	0.012	0.008	0.017
Cycled cell					
Sample No.	A96#	A97#	A98#	A99#	A100#
Mass before test (g)	84.06	85.16	85.71	82.68	83.86
Mass after test (g)	84.05	85.14	85.68	82.65	83.83
Mass loss ratio (%)	0.011	0.023	0.035	0.036	0.035
Sample No.	B96#	B97#	B98#	B99#	B100#
Mass before test (g)	155.99	155.89	155.30	155.17	155.54
Mass after test (g)	155.94	155.86	155.27	155.13	155.51
Mass loss ratio (%)	0.032	0.019	0.019	0.025	0.019
Sample No.	C96#	C97#	C98#	C99#	C100#
Mass before test (g)	230.18	227.75	229.60	230.11	232.67
Mass after test (g)	230.15	227.73	229.57	230.07	232.63
Mass loss ratio (%)	0.013	0.008	0.013	0.017	0.017
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%					

19	**TABLE: Low Pressure (Altitude Simulation) Test**				**P**
Ambient temperature: 22.4°C					
Fully Charged Cell					
Sample No.	A101#	A102#	A103#	A104#	A105#
Mass before test (g)	84.70	81.36	80.86	84.80	83.82
Mass after test (g)	84.69	81.36	80.85	84.80	83.81
Mass loss ratio (%)	0.011	0.000	0.012	0.000	0.011
Sample No.	B101#	B102#	B103#	B104#	B105#
Mass before test (g)	156.31	154.50	157.79	158.38	154.81
Mass after test (g)	156.31	154.49	157.78	158.38	154.80
Mass loss ratio (%)	0.000	0.006	0.006	0.000	0.006
Sample No.	C101#	C102#	C103#	C104#	C105#
Mass before test (g)	232.15	229.44	232.63	231.50	231.27
Mass after test (g)	232.14	229.44	232.62	231.50	231.26

Mass loss ratio (%)	0.004	0.000	0.004	0.000	0.004
Cycled cell					
Sample No.	A106#	A107#	A108#	A109#	A110#
Mass before test (g)	82.98	80.47	81.20	84.97	84.33
Mass after test (g)	82.97	80.47	81.19	84.96	84.32
Mass loss ratio (%)	0.012	0.000	0.012	0.011	0.011
Sample No.	B106#	B107#	B108#	B109#	B110#
Mass before test (g)	158.16	157.07	157.28	157.45	158.49
Mass after test (g)	158.16	157.06	157.28	157.44	158.48
Mass loss ratio (%)	0.000	0.006	0.000	0.006	0.006
Sample No.	C106#	C107#	C108#	C109#	C110#
Mass before test (g)	230.16	232.56	231.59	233.93	227.69
Mass after test (g)	230.16	232.55	231.58	233.92	227.69
Mass loss ratio (%)	0.000	0.004	0.004	0.004	0.000
Supplementary information: no explosion or catch fire, in addition the sample did not vent or leak. Max loss less than 0.1%					

--End of report--

Attachment 1 Equipment list

Report No.: CN21HY5J 001

Name	Equipment No.	Model	Manufacturer	Last Calibration date	Next Calibration date
Battery Crush Tester	LABJYT-006	RS-6006A-GDW	INFINITY	2021-03-09	2022-03-08
Secondary Battery Test System	LABJCG-146	CT-4008-20V20A-NA	NEWARE	2021-05-28	2022-05-27
Secondary Battery Test System	LABJCG-015	PT60V40B	HYNN	2021-01-04	2022-01-03
Battery Internal resistance Tester	LABDXY-001	BT3563	HIOKI	2021-04-30	2022-04-29
Data Collector	LABCJQ-028	LR8431-30	HIOKI	2021-01-05	2022-01-04
Impact Tester	LABZWJ-002	BE-8106	BELL	2021-01-04	2022-01-03
Short-Circuit Tester	LABDLY-007	BE-DL-500ADZ-12	BELL	2021-05-31	2022-05-30
High Low Temperature Chamber	LABGWX-011	HY-225LX	HUAYIN	2021-01-08	2022-01-07
Electronic Balance	LABDZC-006	GB12002	SHINKO	2021-03-05	2022-03-04
Mechanical Shock Tester	LABJXJ-002	SKT30	LABTONE	2021-01-04	2022-01-03
Vibration Tester	LABZDJ-006	DC-2200-26	STI	2020-07-30	2021-07-29
High Low Temperature Chamber	LABGDW-007	VTT-80	SUNWOOD	2021-01-04	2022-01-03
Vacuum Drier	LABZKX-003	BE-ZK-125L	BELL	2021-01-11	2022-01-10
Projectile Tester	LABRSY-001	BE-6046	BELL	2021-01-04	2022-01-03

Product: Rechargeable Li-ion Cell

Type Designation: HK668090, HK978090, HK8080130, HK1280130

Figure 1 Front view of cell (model: HK668090)

Figure 2 Back view of cell (model: HK668090)

Product: Rechargeable Li-ion Cell

Type Designation: HK668090, HK978090, HK8080130, HK1280130

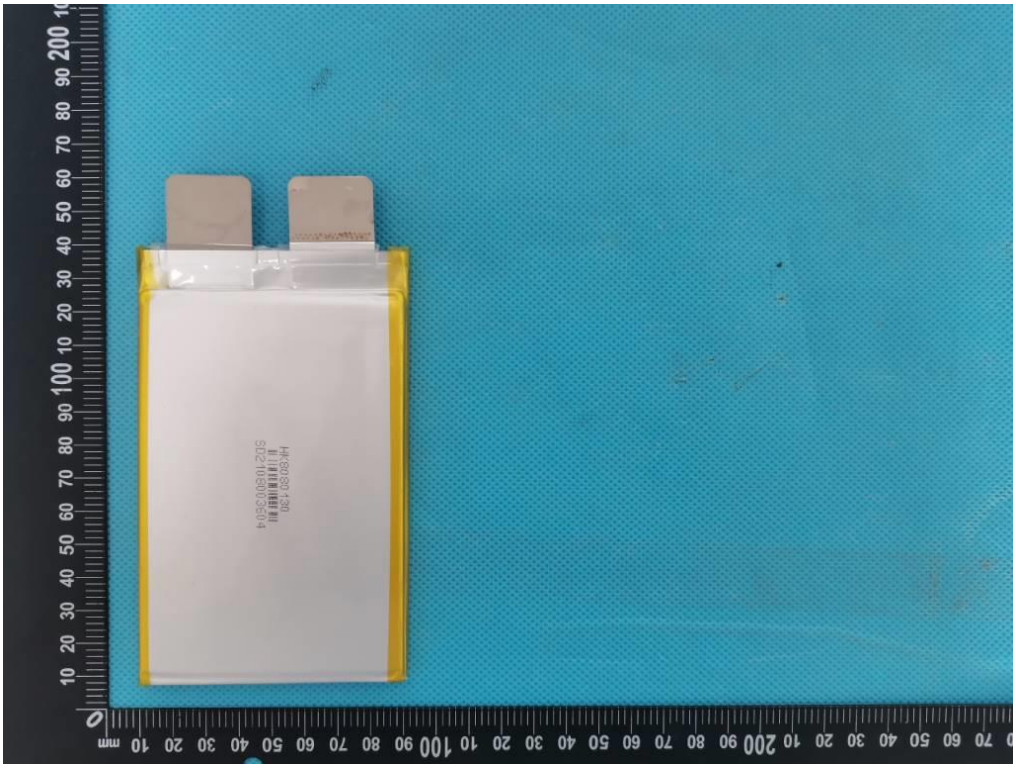


Figure 3 Front view of cell (model: HK8080130)

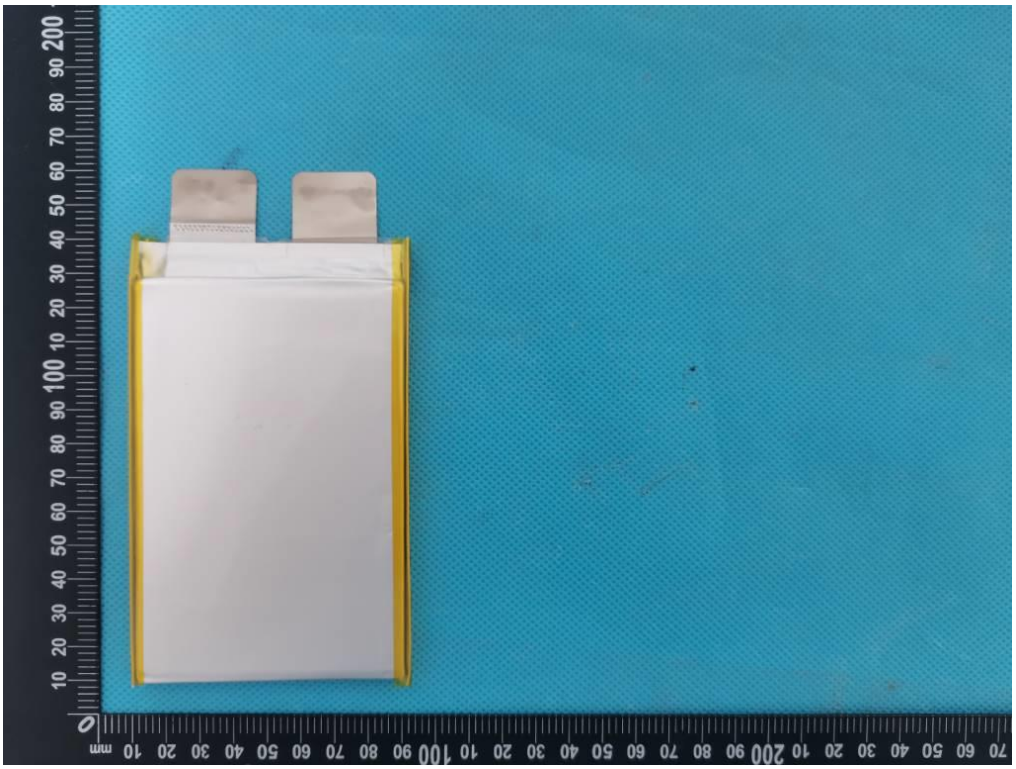


Figure 4 Back view of cell (model: HK8080130)

Product: Rechargeable Li-ion Cell

Type Designation: HK668090, HK978090, HK8080130, HK1280130

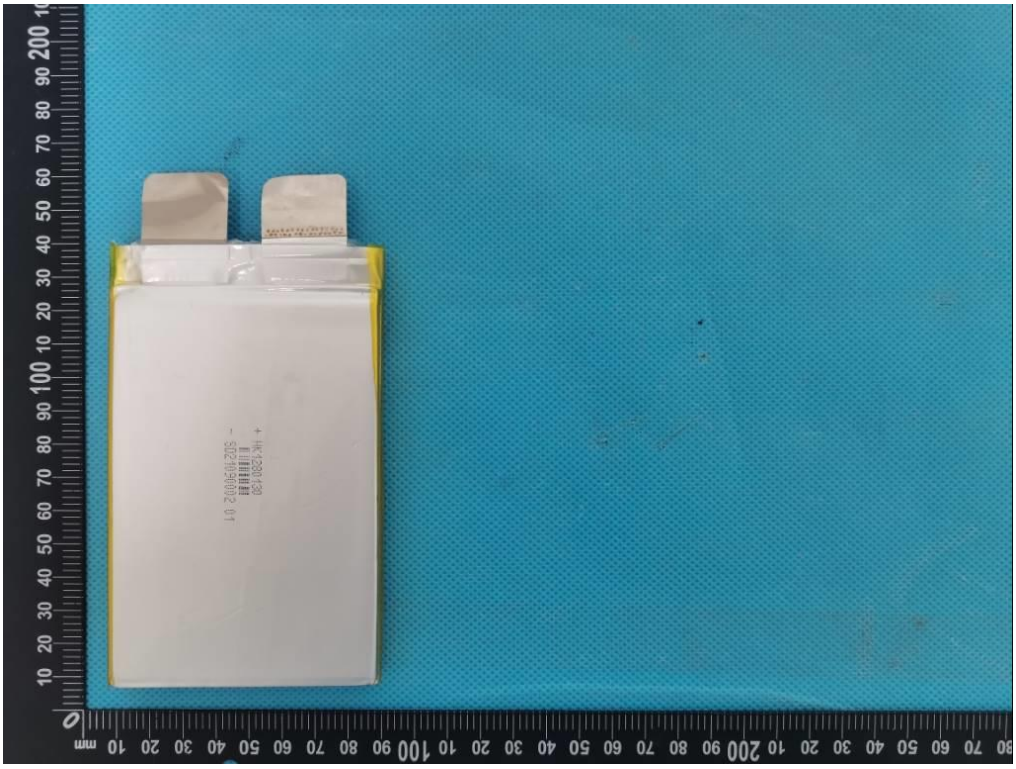


Figure 5 Front view of cell (model: HK1280130)

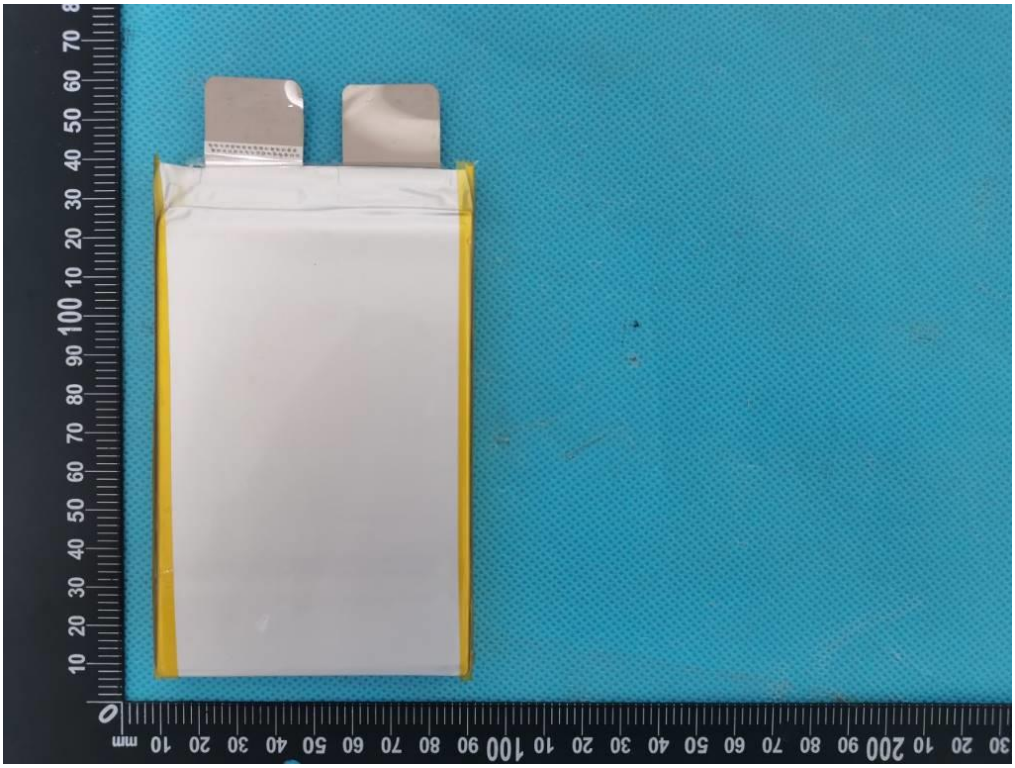


Figure 6 Back view of cell (model: HK1280130)