TEST REPORT

Applicant :

Address :

Manufacturer :

Address :

Report on the submitted samples said to be:

Sample Name	:	Rechargeable Li-ion Cell
Tested model	:	502030
Date of Sample Received	:	September 24, 2024
Testing Period	:	September 24, 2024 ~ September 29, 2024
Results	:	Please refer to next page(s).

****

TEST REQUEST

Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 - Lead, Cadmium & Mercury content

Conclusion

Pass

****

Signed for and on behalf of AZT

Jack Zhong

Tested part(s):

01 Rechargeable Li-ion Cell

Results:

A.1. Regulation (EU) 2023/1542 amending Directive 2008/98/EC and Regulation (EU) 2019/1020 - Lead, Cadmium & Mercury content

Test Method: With reference to IEC 62321-5:2013 & IEC 62321-4:2013+AMD1:2017 CSV, analysis was performed by Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES).

Test Items	Unit	Results	MDL	Limit
		01		
Lead (Pb)	%	N.D.	0.0005	0.01*
Mercury (Hg)	%	N.D.	0.0005	0.0005
Cadmium(Cd)	%	N.D.	0.0005	0.002

Remark:

Battery label requirements:

1. General information of batteries: The information on all battery labels should include ten items: manufacturer information, battery type and identification information, manufacturing address, production date (month and year), weight, capacity, chemical composition, harmful substances present in the battery (excluding mercury, cadmium or lead), available fire extinguishing agents, and key raw materials;

2. Capacity information labels: Rechargeable portable batteries, LMT batteries, and SLI batteries should have labels containing their capacity information;

3. Separate collection symbol: All batteries should be marked with a cross marked wheeled trash can symbol. In addition, batteries with cadmium content exceeding 0.002% or lead content exceeding 0.004% should have corresponding chemical element symbols added to the trash can label; The relevant chemical symbols indicating the content of heavy metals should be printed below the separately collected symbols and cover at least a quarter of the area of the symbol;

4. QR code: All batteries should be labeled with a QR code;

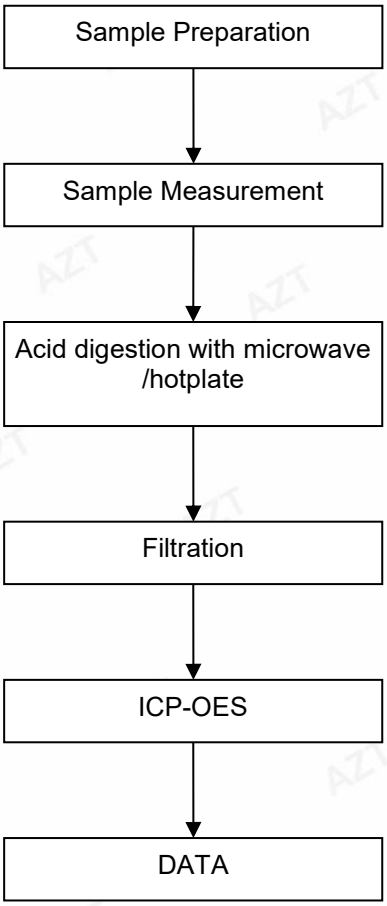
5. CE Mark and EU Declaration of Conformity: Batteries should be labeled with a CE mark before being placed on the market, and an EU Declaration of Conformity should be drafted.

Note:

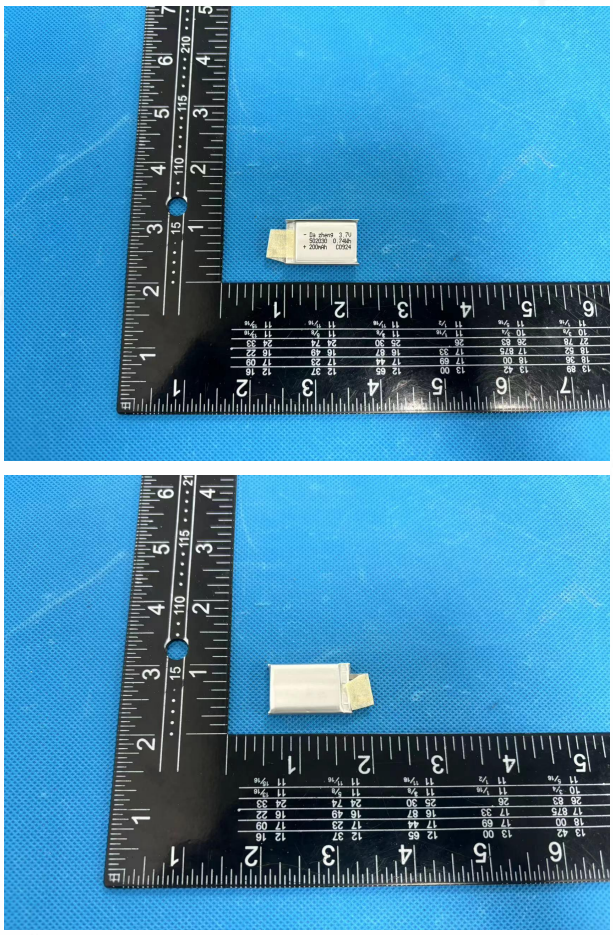
- *=1. From 18 August 2024, portable batteries, whether or not incorporated into appliances, shall not contain more than 0,01 % of lead (expressed as lead metal) by weight.
  2. The restriction set out in point 1 shall not apply to portable zinc-air button cells until 18 August 2028.
- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- mg/kg = milligram per kilogram = ppm
- % = percentage by weight, 0.0001% = 1 mg/kg
- Results shown are of total weight of the battery sample.
- Flow chart is included
- Photo appendix is included

Appendix

Lead /Cadmium/Mercury Testing Flow Chart



The photo of the sample



AZT authenticate the photo on original report only

Statement:

1. This test report is invalid without the signature of the approver and the special seal of the company's report.
2. The copy of the test report is invalid if the "special seal for testing" or "Special Seal for testing" or the official seal of the testing unit is not re-stamped.
3. After the test report is altered, the test report is invalid.
4. If there is any objection to the test report, please submit written comments to the laboratory within 15 days from the date of receipt of the report.
5. This test is only responsible for samples provided by customers.
6. This report shall not be reproduced in whole or in part without the written authorization of the Company.
7. The laboratory is not responsible for sampling, all samples are provided by customers.
8. The test results in this test report are only related to the samples provided by the customer.
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*** End of Report ***

TEST REPORT
IEC 62133-2
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 – Part 2: Lithium systems

Report Number.....:	ECT20240910016
Date of issue.....:	2024-10-17
Total number of pages.....:	19 pages
Tested by (name + signature).....:	Ryan.Lu
Checked by (name + signature).....:	Eddie.Shi
Approved by (name + signature)...:	Eric.Ren

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

Test specification:	
Standard.....:	IEC 62133-2: 2017, IEC 62133-2:2017/AMD1:2021
Test procedure.....:	Type Test
Test result.....:	Pass
Non-standard test method.....:	N/A

Testing laboratory.....:	Shenzhen ECT Testing Technology Co.,Ltd
Address.....:	B202, Block A.B, Huijuxinqiao 107 Chuangzhi Park, No.18, Shangnan Shangliao Industrial Road, Shangliao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China
Testing location.....:	As above

Test item description.....:	Lithium-ion Polymer Cell
Trade Mark.....:	N/A
Manufacturer.....:	Same as applicant
Model/Type reference.....:	502030
Ratings.....:	3.7V, 200mAh, 0.74Wh

Note:
This report shall not be reproduced except in full, without the written approval of Shenzhen ECT Testing Technology Co.,Ltd This report may be altered or revised by Shenzhen ECT Testing Technology Co.,Ltd personnel only, and shall be noted in the revision section of the report. The test result in the report only apply to the tested samples.

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

Attachment 1: Photo Documentation (1 page).

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
cl.7.1 Charging procedure for test purposes (for Cells); cl.7.2.1 Continuous charging at constant voltage (Cells); cl.7.3.1 External short-circuit (Cells); cl.7.3.3 Free fall (Cells); cl.7.3.4 Thermal abuse (Cells); cl.7.3.5 Crush (Cells); cl.7.3.7 Forced discharge (Cells); cl.7.3.9 Design evaluation – Forced internal short-circuit (Cells). The electrolyte type of this cell doesn't belong to polymer, and the additional test cl.7.3.9 was carried out to evaluate the cell. Tests are made with the number of cells specified in IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021 Table 1.	**Shenzhen ECT Testing Technology Co.,Ltd** B202, Block A.B, Huijuxinqiao 107 Chuangzhi Park, No.18, Shangnan Shangliao Industrial Road, Shangliao Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, China

Summary of compliance with National Differences (List of countries addressed):

N/A

☒ **The product fulfils the requirements of EN 62133-2:2017, EN 62133-2:2017/A1:2021.**

Use of uncertainty of measurement for decisions on conformity (decision rule):

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty (“simple acceptance” decision rule, previously known as “accuracy method”).

☐ Other: N/A (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

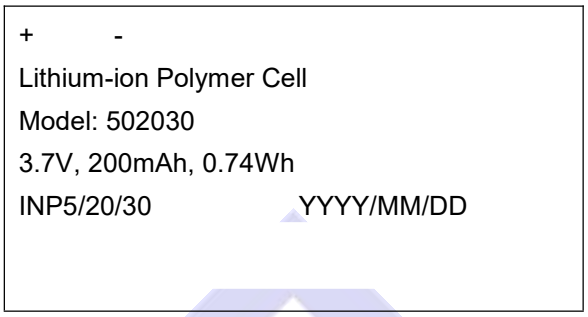
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

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:

“YYYY” means year for manufacture;

“MM” means month for manufacture;

“DD” means day for manufacture.

Test item particulars..... :	
Classification of installation and use.....:	To be defined in final product
Supply Connection.....:	Electrode plate
Recommend charging method declared by the manufacturer.....:	Charging the cell with 40mA constant current and 4.2V constant voltage until the current reduces to 4mA at ambient 20°C±5°C
Discharge current (0,2 It A).....:	40mA
Specified final voltage..... :	2.75V
Upper limit charging voltage per cell..... :	4.2V
Maximum charging current..... :	200mA
Charging temperature upper limit.....:	55°C
Charging temperature lower limit..... :	0°C
cell electrolyte type..... :	☐ gel ☐ solid ☒ N/A
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.....:	2024-09-10
Date (s) of performance of tests.....:	2024-09-10 to 2024-10-15

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 and other remarks:

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

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

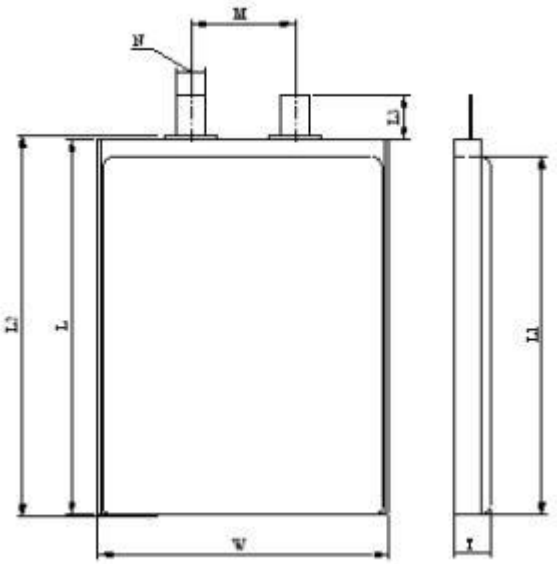
The main features of the cell are shown as below (clause 7.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
502030	200mAh	3.7V	40mA	40mA	200mA	200mA	4.2V	2.75V

The main features of the cell are shown as below (clause 7.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
502030	4.2V	10mA	0°C	55°C

Construction:



T: Max 5.0mm, W: Max 20.0mm, L: Max 30.0mm
Cell

Circuit diagram:

Not, Only cell.

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
4	**PARAMETER MEASUREMENT TOLERANCES**		P
	Parameter measurement tolerances		P
5	**GENERAL SAFETY CONSIDERATIONS**		P
5.1	**General**		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		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	No metal case exists.	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 clearance and creep age 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	Venting mechanism exists on narrow side of the 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/A
5.4	**Temperature, voltage and current management**	Only cell.	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 specified chargers are designed to maintain charging within the temperature, voltage and current limits specified		N/A
5.5	**Terminal contacts**		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Electrode plate complied with the requirements	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance	Complied	P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminal contacts are arranged to minimize the risk of short-circuit		P
5.6	**Assembly of cells into batteries**	Only cell.	N/A
5.6.1	General		N/A
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region		N/A
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify 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 circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		N/A
	Protective circuit components added as appropriate and consideration given to the end-device application		N/A
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance.		N/A
5.6.2	Design recommendation		N/A
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, 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, it is recommended that charging is stopped when the upper limit of the charging voltage 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

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		N/A
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage		N/A
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		N/A
5.6.3	Mechanical protection for cells and components of batteries		N/A
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse		N/A
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product		N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		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	Complied. Quality plan provided.	P
5.8	**Battery safety components**	Only cell.	N/A
	According annex F		N/A
6	**TYPE TEST AND SAMPLE SIZE**		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1	Not coin cells	N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and over discharge protection	Only cell.	N/A
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test	Only cell.	N/A
7	**SPECIFIC REQUIREMENTS AND TESTS**		**P**
7.1	**Charging procedure for test purposes**		P
7.1.1	First procedure		P
	This charging procedure applies to sub clauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage		P
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
	After stabilization for 1 h to 4 h, at an ambient temperature of the highest test temperature and the lowest test temperature, respectively as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant current to constant voltage charging method.	Charge temperature 0-55°C declared. 60°C used for upper limit tests; -5°C used for lower limit tests	P
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)	Tested complied.	P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer	Charging for 7 days with 40mA.	P
	Results: No fire. No explosion. No leakage..... :	(See appended table 7.2.1)	P
7.2.2	Case stress at high ambient temperature (battery)	Only cell.	N/A
	Oven temperature (°C)..... :	70°C	—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		N/A
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)	Tested complied.	P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See appended table 7.3.1)	P
7.3.2	External short-circuit (battery)	Only cell.	N/A
	The batteries were tested until one of the following occurred:		N/A
	- 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
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		N/A
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		N/A
	Results: No fire. No explosion..... :		N/A
7.3.3	Free fall	Tested complied.	P
	Results: No fire. No explosion	No fire. No explosion.	P
7.3.4	Thermal abuse (cells)	Tested complied.	P
	Oven temperature (°C)..... :	130°C	—
	Results: No fire. No explosion	No fire. No explosion	P
7.3.5	Crush (cells)	Tested complied.	P
	The crushing force was released upon:		P
	- The maximum force of 13 kN±0,78kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: No fire. No explosion:	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery	Only cell.	N/A
	The supply voltage which is:		N/A
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or		N/A
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		N/A
	Test was continued until the temperature of the outer casing:		N/A
	- 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
7.3.7	Forced discharge (cells)	Tested complied.	P
	Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer	Lower limit discharge voltage 2.75V.	P
	The discharged cell is then subjected to a forced discharge at 1 It A to the negative value of the upper limit charging voltage		P
	- The discharge voltage reaches the negative value of upper limit charging voltage within the testing duration. The voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	- The discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration. The test is terminated at the end of the testing duration		P
	Results: No fire. No explosion:	(See appended table 7.3.7)	P
7.3.8	Mechanical tests (batteries)	Only cell.	N/A
7.3.8.1	Vibration		N/A
	Results: No fire, no explosion, no rupture, no leakage or venting.....:		N/A
7.3.8.2	Mechanical shock		N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire.....:		N/A
7.3.9	Design evaluation – Forced internal short-circuit (cells)	Tested complied.	P
	The cells complied with national requirement for.....:	France, Japan, Republic of Korea, Switzerland.	—
	The pressing was stopped upon:		P
	- 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 appended table 7.3.9)	P
8	**INFORMATION FOR SAFETY**		P
8.1	**General**		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	Information for safety mentioned in manufacturer's specifications.	P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards	Only cell.	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, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		N/A
8.2	**Small cell and battery safety information**	Small cell.	P
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		P
	- Keep small cells and batteries which are considered swallow able out of the reach of children		P
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		P
	- In case of ingestion of a cell or battery, seek medical assistance promptly		P
9	**MARKING**		**P**
9.1	**Cell marking**		P
	Cells marked as specified in IEC 61960, except coin cells	The battery is marked in accordance with IEC 61960, see page 3.	P
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity	Not coin cells	N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		P
9.2	**Battery marking**	Only cell.	N/A
	Batteries marked as specified in IEC 61960, except for coin batteries		N/A
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity.		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Batteries also marked with an appropriate caution statement		N/A
	Terminals have clear polarity marking on the external surface of the battery		N/A
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A
9.3	**Caution for ingestion of small cells and batteries**	Small cells.	P
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2	Not coin cells	N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		P
9.4	**Other information**		P
	Storage and disposal instructions	Information for safety mentioned in manufacturer's specifications.	P
	Recommended charging instructions	Information for safety mentioned in manufacturer's specifications.	P
10	**PACKAGING AND TRANSPORT**		N/A
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3	Not coin cells.	N/A
ANNEX A	**CHARGING AND DISCHARGING 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		P
A.3.2	Upper limit charging voltage	4.2V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.2V applied.	N/A
A.4	**Consideration of temperature and charging current**		P
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is: 0~55°C.	P
A.4.3	High temperature range	Charging high temperature declared by client is 55°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 the high temperature range		P
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range	No documents provided by client explaining reason of 55°C as high limit temperature limit, 60°C used to meet the requirement.	P
A.4.4	Low temperature range	Charging low temperature declared by client is 0°C	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 the low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	No documents provided by client explaining reason of 0°C as low limit temperature limit, -5°C used to meet the requirement.	P
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging 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
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
A.6.4	Damaged separator precaution		P
A.6.5	Caution for rewinding separator and electrode		P
A.6.6	Insulation film for preventing short-circuit		P
A.6.7	Caution when disassembling a cell		P
A.6.8	Protective equipment for safety		P
A.6.9	Caution in the case of fire during disassembling		P
A.6.10	Caution for the disassembling process and pressing the electrode core		P
A.6.11	Recommended specifications for the pressing device		P
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		N/A
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		N/A
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		N/A
D.1	**General**	Not coin cells	N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement.....:	(See appended table D.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	**PACKAGING AND TRANSPORT**		N/A
ANNEX F	**COMPONENT STANDARDS REFERENCES**		N/A

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (mA)**	**OCV before test (Vdc)**	**Results**
Cell #1	4.20	40	4.18	P
Cell #2	4.20	40	4.19	P
Cell #3	4.20	40	4.18	P
Cell #4	4.20	40	4.18	P
Cell #5	4.20	40	4.19	P
Supplementary information: - No fire or explosion - No leakage				

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature ~~rise~~ ΔT, (°C)**	**Results**
Samples charged at charging temperature upper limit (60°C)					
Cell #6	55.3	4.17	82	105.3	P
Cell #7	55.3	4.18	86	101.8	P
Cell #8	55.3	4.18	84	103.2	P
Cell #9	55.3	4.17	87	105.6	P
Cell #10	55.3	4.18	83	102.5	P
Samples charged at charging temperature lower limit (-5°C)					
Cell #11	55.5	4.12	85	103.2	P
Cell #12	55.5	4.13	81	101.7	P
Cell #13	55.5	4.13	87	100.3	P
Cell #14	55.5	4.12	80	102.5	P
Cell #15	55.5	4.13	82	103.4	P
Supplementary information: - No fire or explosion					

7.3.5	TABLE: Crush (cells)			P
Sample no.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit (60°C)				
Cell #29	4.17	4.17	13	P
Cell #30	4.17	4.17	13	P
Cell #31	4.18	4.17	13	P
Cell #32	4.17	4.16	13	P
Cell #33	4.18	4.17	13	P
Samples charged at charging temperature lower limit (-5°C)				
Cell #34	4.13	4.12	13	P
Cell #35	4.12	4.12	13	P
Cell #36	4.12	4.11	13	P
Cell #37	4.13	4.13	13	P
Cell #38	4.13	4.13	13	P
Supplementary information: - No fire or explosion				

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (mA)**	**Lower limit discharge voltage (Vdc)**	**Results**
Cell #39	3.03	200	2.75	P
Cell #40	3.02	200	2.75	P
Cell #41	3.05	200	2.75	P
Cell #42	3.03	200	2.75	P
Cell #43	3.04	200	2.75	P
Supplementary information: - No fire or explosion				

7.3.9	TABLE: Forced internal short circuit (cells)				P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location[1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit (60°C)					
Cell #44	60	4.17	1	400	P
Cell #45	60	4.18	1	400	P
Cell #46	60	4.18	1	400	P
Cell #47	60	4.17	1	400	P
Cell #48	60	4.17	1	400	P
Samples charged at charging temperature lower limit (-5°C)					
Cell #49	-5	4.12	1	400	P
Cell #50	-5	4.13	1	400	P
Cell #51	-5	4.13	1	400	P
Cell #52	-5	4.12	1	400	P
Cell #53	-5	4.13	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.

D.2	TABLE: Internal AC resistance for coin cells			N/A
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results [1)]**

Supplementary information:

	TABLE: Critical components information				P
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Cell		502030	3.7V, 200mAh	IEC 62133-2: 2017, IEC 62133-2:2017/AMD1:2021	Tested with appliance
-Electrolyte	Dong Guan Tian Feng Power Material Co., LTD	TF-022	$LiPF_6$+DEC+EC+PC	--	--
-Separator	FOSHAN JINHUI HI-TECK OPOELECTRONIC MATERIAL CO., LTD	16μm	PE, 0.016mm, Shutdown temperature: 135°C	--	--
-Negative Electrode	Jiangxi Zichen Technology Co. LTD	FT-1	Graphite	--	--
-Positive Electrode	Qingdao Qianyun High-tech New Materials Co., Ltd	QY-901	$Li(Ni_{0.5}Co_{0.2}Mn_{0.3})O_2$	--	--
Supplementary information: **[1)] Provided evidence ensures the agreed level of compliance.**					

-- End of Report --

Attachment 1 Photo Documentation

Product: Lithium-ion Polymer Cell

Type Designation: 502030

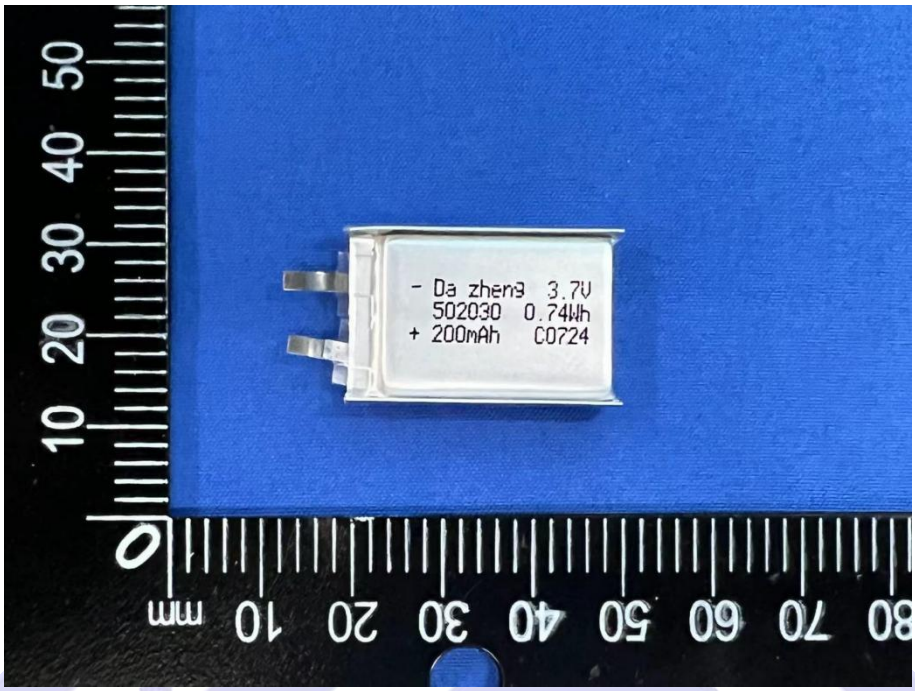


Figure 1 Front view of cell

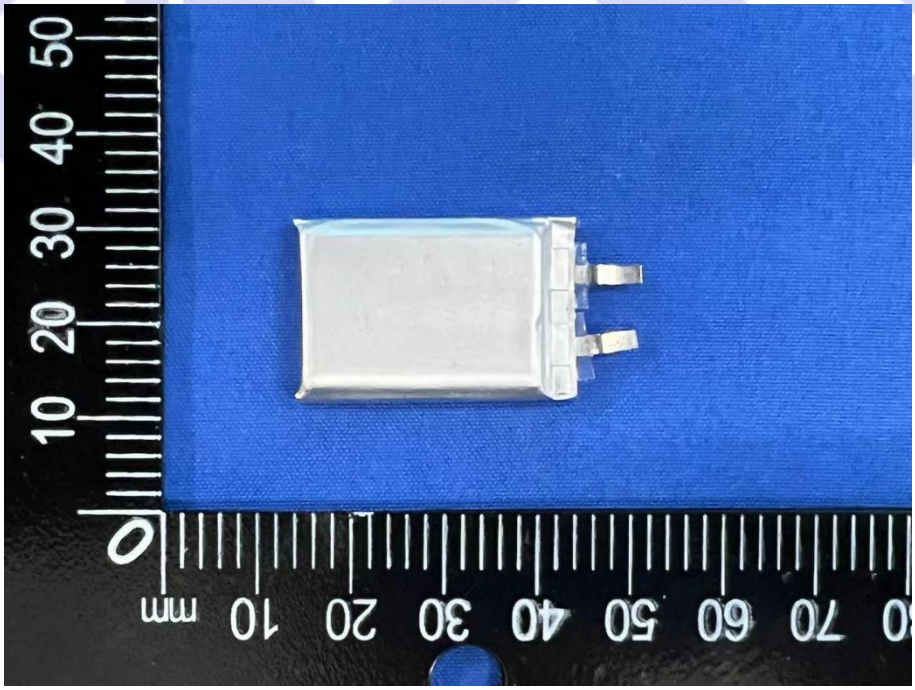


Figure 2 Back view of cell

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