Report No. : TSZ24E6043D02-01 

# Test Report

| | | |
|---|---|---|
| **Client** | : | |
| **Address** | : | |

**The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client**

| | | |
|---|---|---|
| Sample Name | : | Polymer li-ion battery |
| Model/P.O. No. | : | 502030 200mAh/ 400909 25mAh/ 450909 30mAh/ 401012 30mAh/ 451012 35mAh/ 501012 40mAh/ 581013 50mAh/ 550815 50mAh/ 502030 250mAh/ 502535 400mAh/ 501240 250mAh/ 501440 300mAh/ 551138 200mAh/ 501240 200mAh/ 601230 200mAh/ 601235 220mAh/ 601435 280mAh/ 602030 300mAh/ 601835 400mAh/ 602025 250mAh |
| Manufacturer | : | |
| Received Date | : | May 13, 2024 |
| Test Period | : | May 13, 2024~May 15, 2024 |
| Test Requested | : | Regulation (EU) 2023/1542 |

| **Conclusion** | | |
|---|---|---|
| - | Lead(Pb), Cadmium(Cd), Mercury(Hg) | **PASS** |

For Further Details, Please Refer To the Following Page(s)

**Approved by:** Jane Liu

**Date:** May 16, 2024

SHENZHEN TIANSU CALIBRATION AND TESTING CO.,LTD. Report Seal (02-01)

**Test Methods**

| Test Items | Test Method | Equipment |
|---|---|---|
| Lead(Pb), Cadmium(Cd) | IEC 62321-5:2013 | ICP-OES |
| Mercury(Hg) | IEC 62321-4:2013+AMD1:2017 | ICP-OES |

**Test Results**

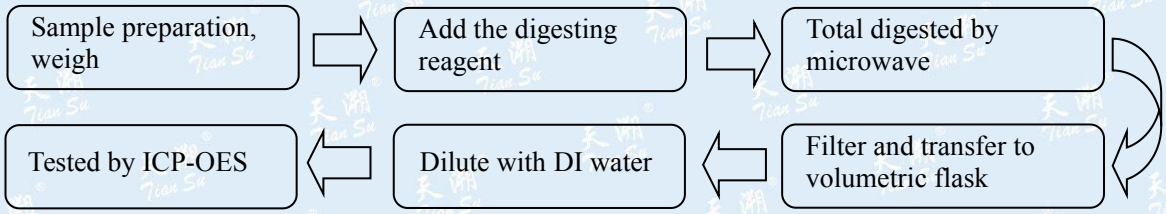
| Test components | Test Item(s) | MDL (%) | Result(s) (%) | Limit (%) |
|---|---|---|---|---|
| Polymer li-ion battery | Lead(Pb) | 0.0005 | N.D. | 0.0100 |
| | Cadmium(Cd) | 0.0005 | N.D. | 0.0020 |
| | Mercury(Hg) | 0.0001 | N.D. | 0.0005 |

Note:

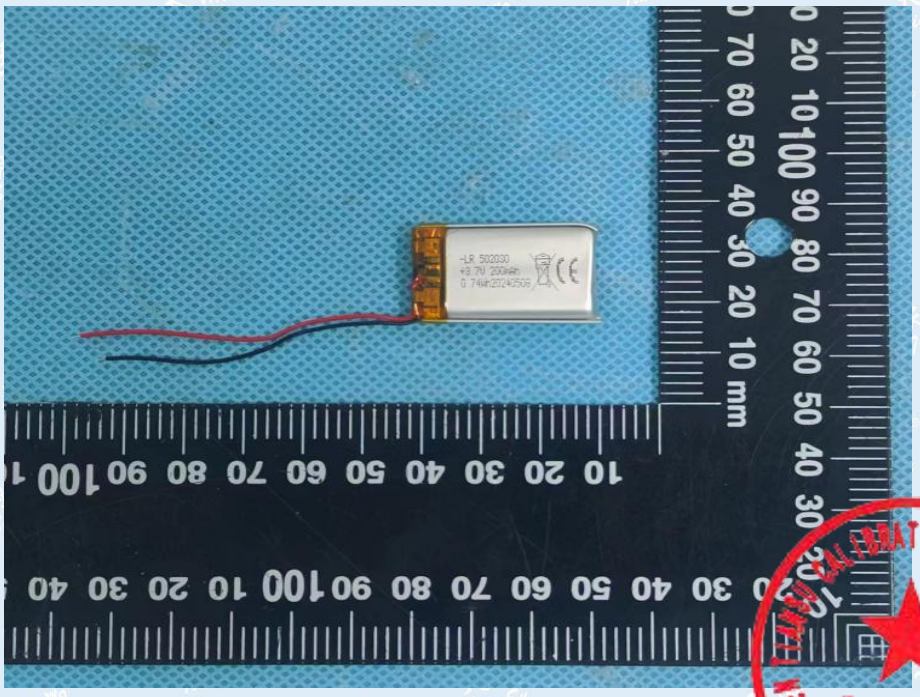
- N.D.=Not Detected (<MDL); MDL=method detection limit.
- According to regulation (EU) 2023/1542, All batteries containing more than 0.002 % cadmium or more than 0.004 % lead, shall be marked with the chemical symbol for the metal concerned: Cd or Pb.
  The relevant chemical symbol indicating the heavy metal content shall be printed beneath the separate collection symbol and shall cover an area of at least one-quarter the size of that symbol.

**Test Process:**

Test Lead(Pb) ,Cadmium(Cd) , Mercury(Hg) concentration:



# Photo of the sample



Sample

********** End of report **********

This report is invalid without the Special Seal of Tiansu. This report shall not be altered, increased or deleted. The results shown in this report refer only to the sample(s) tested.

Test Report issued under the responsibility of:

# 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. .....:** | TSZ24FH011A02-01 |
| **Date of issue .....:** | 2024-08-15 |
| **Total number of pages.....:** | 23 |
| **Name of Testing Laboratory preparing the Report.....:** | Shenzhen Tiansu Calibration and Testing Co., Ltd. |
| **Applicant's name.....:** | |
| **Address .....:** | |
| **Test specification:** | |
| **Standard.....:** | IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021 |
| **Test procedure .....:** | CB Scheme |
| **Non-standard test method.....:** | N/A |
| **TRF template used .....:** | IECEE OD-2020-F1:2021, Ed.1.4 |
| **Test Report Form No.....:** | IEC62133_2C |
| **Test Report Form(s) Originator.....:** | DEKRA Certification B.V. |
| **Master TRF.....:** | Dated 2022-07-01 |



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 IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

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 NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

| | |
|---|---|
| **Test item description .....:** | Li-ion Polymer Cell |
| **Trade Mark(s).....:** | N/A |
| **Manufacturer.....:** | Same as applicant |
| **Model/Type reference .....:** | 450909 |
| **Ratings .....:** | 3.7V, 30mAh, 0.111Wh |

| | | | |
|---|---|---|---|
| **Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):** | | | |
| ☒ | **CB Testing Laboratory:** | Shenzhen Tiansu Calibration and Testing Co., Ltd. | |
| **Testing location/ address ..... :** | | Building 4, No.2, Jinlong Road, Longgang District, Shenzhen, Guangdong, China. | |
| **Tested by (name, function, signature) ..... :** | | Evan Luo/Project Handler | Evan Luo |
| **Approved by (name, function, signature) .. :** | | Orren Zeng/Reviewer | Orren Zeng |
| ☐ | **Testing procedure: CTF Stage 1:** | | |
| **Testing location/ address ..... :** | | | |
| **Tested by (name, function, signature) ..... :** | | | |
| **Approved by (name, function, signature) .. :** | | | |
| ☐ | **Testing procedure: CTF Stage 2:** | | |
| **Testing location/ address ..... :** | | | |
| **Tested by (name + signature) ..... :** | | | |
| **Witnessed by (name, function, signature). :** | | | |
| **Approved by (name, function, signature) .. :** | | | |
| ☐ | **Testing procedure: CTF Stage 3:** | | |
| ☐ | **Testing procedure: CTF Stage 4:** | | |
| **Testing location/ address ..... :** | | | |
| **Tested by (name, function, signature) ..... :** | | | |
| **Witnessed by (name, function, signature). :** | | | |
| **Approved by (name, function, signature) .. :** | | | |
| **Supervised by (name, function, signature) :** | | | |

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

National Differences (3 pages)

Enclosures (4 pages)

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| **Testing for cell: 450909**<br>7.2.1 Continuous charging at constant voltage (cells)<br>7.3.1 External short-circuit (cell)<br>7.3.3 Free fall<br>7.3.4 Thermal abuse (cells)<br>7.3.5 Crush (cells)<br>7.3.7 Forced discharge (cells)<br>7.3.9 Design evaluation – Forced internal short-circuit (cells)<br><br>The electrolyte type of this cell doesn't belong to polymer, and the additional test 7.3.9 was carried out to evaluate the cell. | Shenzhen Tiansu Calibration and Testing Co., Ltd.<br>Building 4, No.2, Jinlong Road, Longgang District, Shenzhen, Guangdong, China. |

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

Republic of Korea, EU group *, United Kingdom (Per customer's request shown separately)

*=No National or Group Differences declared

☒ The product fulfils the requirements of KC 62133-2(2020-07)

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

☒ The product fulfils the requirements of BS 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:… (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.**

+ -

Li-ion Polymer Cell

450909 ICP5/10/12

3.7V, 30mAh, 0.111Wh

240622 Made in China

Remark:

1. "240622" represents the production date: June 22, 2024.

2. The following warning language is to be provided with the information packaged with the small cells or equipment using them:

- Keep small cells which are considered swallowable out of the reach of children.

- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion.

- In case of ingestion of a cell, seek medical assistance promptly.

| | |
|---|---|
| **Test item particulars ..... :** | -- |
| **Classification of installation and use ..... :** | -- |
| **Supply Connection ..... :** | DC electrode tab |
| **Recommend charging method declared by the manufacturer..... :** | CC/CV |
| **Discharge current (0,2 It A) ..... :** | 6mA |
| **Specified final voltage ..... :** | 3.0V |
| **Upper limit charging voltage per cell ..... :** | 4.2V |
| **Maximum charging current..... :** | 90mA |
| **Charging temperature upper limit..... :** | 45°C |
| **Charging temperature lower limit ..... :** | 0°C |
| **Polymer cell electrolyte type ..... :** | ☐ gel polymer ☐ solid polymer ☒ 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..... :** | 2024-06-27 |
| **Date (s) of performance of tests ..... :** | 2024-07-06 to 2024-07-27 |

**General remarks:**

"(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.**

**Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:**

| | |
|---|---|
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... : | ☐ **Yes**<br>☒ **Not applicable** |

**When differences exist; they shall be identified in the General product information section.**

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

**General product information and other remarks:**

- Cell (Model: 450909) has been evaluated to comply with ST/SG/AC.10/11/Rev.7/Amend1/Subsection 38.3, test report No.: TSZ24FH011A64-01 issued on 2024-07-21, issued by

- Type reference ICP5/10/12 is IEC designation which is identical Model 450909 except for model designation.

- Detailed information of the cell, as following:

| Product Name: Li-ion Polymer Cell | |
|---|---|
| Type | Cell |
| Model | 450909 |
| Nominal Capacity | 30mAh |
| Nominal Voltage | 3.7V |
| Maximum Charge Voltage | 4.2V |
| Normal Charge Current | 6mA |
| Maximum Charge Current | 90mA |
| Normal Discharge Current | 6mA |
| Maximum Discharge Current | 90mA |
| Discharge Cut-Off Voltage | 3.0V |
| End of charging current | 0.6mA |
| Charging Temperature Range | 0°C~45°C |
| Discharging Temperature Range | 0°C~45°C |

Remark:
Second charging procedure for cell model 450909:
0°C: CC-CV charge cell at Max. charging current 90mA to 4.2V and until current reaches 1.5mA.
45°C: CC-CV charge cell at Max. charging current 90mA to 4.2V and until current reaches 1.5mA.

| 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** | Cell only | 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 clearances and creepage 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 the narrow side of the pouch cell. | P |
| | Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief | | N/A |
| **5.4** | **Temperature, voltage and current management** | Cell only | 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 | | P |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance | | P |
| | Terminal contacts are arranged to minimize the risk of short circuits | | P |
| **5.6** | **Assembly of cells into batteries** | Cell only | N/A |
| 5.6.1 | General | | N/A |
| | Each battery has 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 has 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 are 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 |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 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 |
| | For batteries consisting of series-connected cells or cell blocks, nominal charge voltage are not 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 are 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 are 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 are 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 are 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 is considered when conducting mechanical tests | | N/A |
| **5.7** | **Quality plan** | | P |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 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.<br>ISO 9001:2015 certificate provided. | P |
| **5.8** | **Battery safety components** | | 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 |
| | The internal resistance of coin cells are measured in accordance with Annex D. Coin cells with internal resistance less than or equal to 3 Ω are tested in accordance with Table 1 | Not coin cells. | N/A |
| | 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 | Cell only. | N/A |
| | When conducting the short-circuit test, consideration is 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 | Cell only. | 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 subclauses 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 has 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 |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 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 | Highest test temperature: 45°C<br>Lowest test temperature: 0°C | P |
| **7.2** | **Intended use** | | P |
| 7.2.1 | Continuous charging at constant voltage (cells) | | 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 | | 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) | Cell only | N/A |
| | Oven temperature (°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) | | P |
| | 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) | Cell only | 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 is conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test | | N/A |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | A single fault applies to protective component parts such as MOSFET (metal oxide semiconductor field-effect transistor), fuse, thermostat or positive temperature coefficient (PTC) thermistor | | N/A |
| | Results: no fire, no explosion .....: | (See appended table 7.3.2) | P |
| 7.3.3 | Free fall | | P |
| | Results: no fire, no explosion | | P |
| 7.3.4 | Thermal abuse (cells) | | P |
| | Oven temperature (°C) .....: | 130 | — |
| | Results: no fire, no explosion | | P |
| 7.3.5 | Crush (cells) | | P |
| | The crushing force was released upon: | | P |
| | - The maximum force of 13 kN ± 0,78 kN 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 | Cell only | 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 |
| | - 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 .....: | (See appended table 7.3.6) | P |
| 7.3.7 | Forced discharge (cells) | | P |
| | Discharge a single cell to the lower limit discharge voltage specified by the cell manufacturer | | 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 |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - 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) | Cell only | 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) | | P |
| | The cells complied with national requirement for ..... : | France, Japan, Korea, Switzerland | — |
| | The pressing was stopped upon: | | P |
| | - A voltage drop of 50 mV has been detected; or | | N/A |
| | - The pressing force of 800N (cylindrical cells) or 400N (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 |
| | Manufacturers of secondary cells provides information about current, voltage and temperature limits of their products | Information for safety mentioned in manufacturer's specifications. | P |
| | Manufacturers of batteries provides information regarding how to minimize and mitigate hazards to equipment manufacturers or end-users | Cell only | N/A |
| | Systems analyses are performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product | Considered in end product. | N/A |
| | As appropriate, any information relating to hazard avoidance resulting from a system analysis is provided to the end user | Considered in end product. | N/A |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Do not allow children to replace batteries without adult supervision | Considered in end product. | 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 swallowable 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 are marked as specified in IEC 61960, except coin cells | IEC Designation: ICP5/10/12 | 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 | | N/A |
| **9.2** | **Battery marking** | Cell only | N/A |
| | Batteries are 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 |
| | Batteries are marked with an appropriate caution statement | | N/A |
| | - Terminals have clear polarity marking on the external surface of the battery, or | | N/A |
| | - 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 include a caution statement regarding the hazards of ingestion in accordance with 8.2 | Not coin cells. | N/A |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion is given on the immediate package | | P |
| **9.4** | **Other information** | | P |
| | The following information are marked on or supplied with the battery: | Information for storage and disposal instructions in manufacturer's specifications. | P |
| | - Storage and disposal instructions | Information for storage and disposal instructions in manufacturer's specifications. | P |
| | - Recommended charging instructions | Information for recommended charging instructions in manufacturer's specifications. | P |
| **10** | **PACKAGING AND TRANSPORT** | | P |
| | Packaging for coin cells are not be 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 applied. | 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 | Charging temperature declared by client is: 0-45°C. | P |
| A.4.2.1 | General | | P |
| A.4.2.2 | Safety consideration when a different recommended temperature range is applied | | P |
| A.4.3 | High temperature range | | N/A |
| A.4.3.1 | General | | N/A |
| A.4.3.2 | Explanation of safety viewpoint | | N/A |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| A.4.3.3 | Safety considerations when specifying charging conditions in the high temperature range | | N/A |
| A.4.3.4 | Safety considerations when specifying a new upper limit in the high temperature range | | N/A |
| A.4.4 | Low temperature range | | N/A |
| A.4.4.1 | General | | N/A |
| A.4.4.2 | Explanation of safety viewpoint | | N/A |
| A.4.4.3 | Safety considerations, when specifying charging conditions in the low temperature range | | N/A |
| A.4.4.4 | Safety considerations when specifying a new lower limit in the low temperature range | | N/A |
| 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 | Cell specified final voltage is 3.0V. | 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 |
| **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 |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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** | | P |
| **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 | | N/A |
| | Coin cells with an internal resistance greater than 3 Ω require no further testing .....: | (See appended table D.2) | N/A |
| | Coin cells with an internal resistance less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1 | | N/A |
| **ANNEX E** | **PACKAGING AND TRANSPORT** | | P |
| **ANNEX F** | **COMPONENT STANDARDS REFERENCES** | | N/A |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 7.2.1 | TABLE: Continuous charging at constant voltage (cells) | P |
|---|---|---|

| Sample No. | Recommended charging voltage Vc (Vdc) | Recommended charging current $I_{rec}$ (A) | OCV before test (Vdc) | Results |
|---|---|---|---|---|
| C01# | 4.2 | 0.006 | 4.192 | A, B |
| C02# | 4.2 | 0.006 | 4.191 | A, B |
| C03# | 4.2 | 0.006 | 4.190 | A, B |
| C04# | 4.2 | 0.006 | 4.189 | A, B |
| C05# | 4.2 | 0.006 | 4.191 | A, B |

**Supplementary information:**

A - No fire or explosion
B - No leakage
C - Others (please explain)

| 7.3.1 | TABLE: External short circuit (cell) | P |
|---|---|---|

| Sample No. | Ambient (°C) | OCV at start of test (Vdc) | Resistance of circuit (mΩ) | Maximum case temperature rise ΔT (K) | Results |
|---|---|---|---|---|---|
| **Samples charged at charging temperature upper limit (45°C)** | | | | | |
| C06# | 55.4 | 4.188 | 85 | 50.3 | A, B |
| C07# | 55.4 | 4.185 | 82 | 52.4 | A, B |
| C08# | 55.4 | 4.188 | 86 | 53.1 | A, B |
| C09# | 55.4 | 4.187 | 87 | 50.8 | A, B |
| C10# | 55.4 | 4.185 | 84 | 51.7 | A, B |
| **Samples charged at charging temperature lower limit (0°C)** | | | | | |
| C11# | 55.1 | 4.089 | 86 | 51.3 | A, B |
| C12# | 55.1 | 4.091 | 85 | 49.8 | A, B |
| C13# | 55.1 | 4.088 | 86 | 50.6 | A, B |
| C14# | 55.1 | 4.087 | 82 | 51.4 | A, B |
| C15# | 55.1 | 4.090 | 88 | 50.8 | A, B |

**Supplementary information:**

A - No fire or explosion
B - The test was completed after the cell casing declines by 20% of the maximum temperature rise.

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 7.3.2 | TABLE: External short circuit (battery) | | | | | N/A |
|---|---|---|---|---|---|---|
| **Sample No.** | **Ambient T (°C)** | **OCV before test (Vdc)** | **Resistance of circuit (mΩ)** | **Maximum case temperature rise ΔT (K)** | **Component single fault condition** | **Results** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **Supplementary information:** | | | | | | |

| 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 (45°C)** | | | | |
| C29# | 4.185 | 4.183 | 13.12 | A, B |
| C30# | 4.188 | 4.187 | 13.11 | A, B |
| C31# | 4.188 | 4.186 | 13.16 | A, B |
| C32# | 4.186 | 4.185 | 13.15 | A, B |
| C33# | 4.186 | 4.184 | 13.14 | A, B |
| **Samples charged at charging temperature lower limit (0°C)** | | | | |
| C34# | 4.085 | 4.083 | 13.11 | A, B |
| C35# | 4.087 | 4.086 | 13.18 | A, B |
| C36# | 4.090 | 4.089 | 13.12 | A, B |
| C37# | 4.086 | 4.085 | 13.17 | A, B |
| C38# | 4.087 | 4.085 | 13.12 | A, B |

**Supplementary information:**

A - No fire or explosion

B - Force released after maximum level reached.

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 7.3.6 | TABLE: Over-charging of battery | | N/A |
|---|---|---|---|
| Constant charging current (A) .....: | | | — |
| Supply voltage (Vdc) .....: | | | — |

| Sample No. | OCV before charging (Vdc) | Total charging time (minute) | Maximum outer case temperature (°C) | Results |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Supplementary information:**

| 7.3.7 | TABLE: Forced discharge (cells) | | | P |
|---|---|---|---|---|

| Sample No. | OCV before application of reverse charge (Vdc) | Measured reverse charge $I_t$ (A) | Lower limit discharge voltage (Vdc) | Results |
|---|---|---|---|---|
| C39# | 3.223 | 0.03 | 3.0 | A, B |
| C40# | 3.195 | 0.03 | 3.0 | A, B |
| C41# | 3.219 | 0.03 | 3.0 | A, B |
| C42# | 3.225 | 0.03 | 3.0 | A, B |
| C43# | 3.231 | 0.03 | 3.0 | A, B |

**Supplementary information:**

A - No fire or explosion

B - The voltage did not reach negative value of upper limit charging voltage.

| 7.3.8.1 | TABLE: Vibration | | | | | N/A |
|---|---|---|---|---|---|---|

| Sample No. | OCV before test (Vdc) | OCV after test (Vdc) | Mass before test (g) | Mass after test (g) | Results |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**Supplementary information:**

| 7.3.8.2 | TABLE: Mechanical shock | | | | | N/A |
|---|---|---|---|---|---|---|

| Sample No. | OCV before test (Vdc) | OCV after test (Vdc) | Mass before test (g) | Mass after test (g) | Results |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

| IEC 62133-2 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **Supplementary information:** | | | | | |

| **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 (45°C)** | | | | | |
| C44# | 45 | 4.186 | 1 | 400 | A, B |
| C45# | 45 | 4.186 | 1 | 400 | A, B |
| C46# | 45 | 4.185 | 1 | 400 | A, B |
| C47# | 45 | 4.187 | 1 | 400 | A, B |
| C48# | 45 | 4.186 | 1 | 400 | A, B |
| **Samples charged at charging temperature lower limit (0°C)** | | | | | |
| C49# | 0 | 4.087 | 1 | 400 | A, B |
| C50# | 0 | 4.089 | 1 | 400 | A, B |
| C51# | 0 | 4.085 | 1 | 400 | A, B |
| C52# | 0 | 4.083 | 1 | 400 | A, B |
| C53# | 0 | 4.088 | 1 | 400 | A, B |

**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.

Remark: There is no particle location 2 in this product.

A - No fire

B - Test concluded when 800N pressure was reached, and 50mV voltage drop was not achieved.

| **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:**

[1)] Coin cells with an internal resistance less than or equal to 3 Ω, see test result on corresponding tables according to Clause 6 and Table 1.

| IEC 62133-2 | | | |
|---|---|---|---|
| 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 | | 450909 | 3.7V, 30mAh | IEC 62133-2:2017/AMD 1:2021 | Tested with appliance |
| -Positive electrode | Xiamen Tungsten Industry Co., Ltd. | L700C | Material: $LiCoO_2$, Dimensions: 0.12mm*125mm*10mm | -- | -- |
| -Negative electrode | Shenzhen Xinpeng Energy Co., Ltd. | S-11 | Material: Graphite or CMC, Super-P, SBR, Dimensions: 0.12mm*138mm*10mm | -- | -- |
| -Separator | Shanghai Enjie New Materials Technology Co., Ltd | PE12μm× 11.5mm | Material: PE, Shutdown temperature: 135ºC, Thickness: 12μm | -- | -- |
| -Electrolyte | Zhuhai Guang Rui New Material Co..Ltd | GR-NLB001 | Composition: $LiPF_6$+Solution, Conductivity (mS/cm):11.6±0.3 | -- | -- |

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

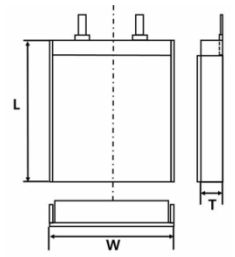
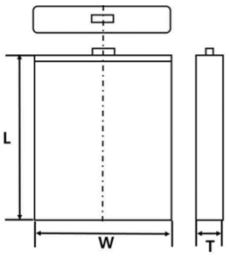
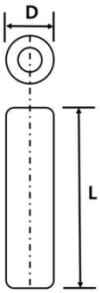
[2)] The CBTL has verified the component information.

[3)] License available upon request.

Report No.: TSZ24FH011A02-01

| ATTACHMENT to IEC62133_2C | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **ATTACHMENT TO TEST REPORT**<br>**IEC 62133-2**<br>**(REPUBLIC OF KOREA) NATIONAL DIFFERENCES**<br>(SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES - SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY LITHIUM CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS - PART 2: LITHIUM SYSTEMS) | | | |
| **Differences according to**.....: | National standard KC62133-2(2020-07) | | |
| **TRF template used: .....:** | IECEE OD-2020-F3:2022, Ed. 1.2 | | |
| **Attachment Form No**.....: | KR_ND_IEC62133_2C | | |
| **Attachment Originator .....**: | KTR | | |
| **Master Attachment**.....: | 2023-08-02 | | |
|  | | | |
| | **National Differences** | | P |
| **7.3.6** | **Over-charging of battery** | | N/A |
| *(Revision)* | ***[Add the bolded text]***<br><br>b) Test<br>The test shall be carried out in an ambient temperature of 20 °C ± 5 °C. Each test battery shall be discharged at a constant current of 0,2 $I_t$ A, to a final discharge voltage specified by the manufacturer. Sample batteries shall then be charged at a constant current of 2,0 $I_t$ A, using a supply voltage which is:<br>• 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<br>• 1,2 times the upper limit charging voltage presented in Table A.1 per cell for series connected multi-cell batteries, and<br>• sufficient to maintain a current of 2,0 $I_t$ A throughout the duration of the test or until the supply voltage is reached.<br>**• In case the charging voltage specified by the manufacturer is higher than the overcharge test voltage, the maximum charging voltage specified by manufacturer should be applied with 2.0 $I_t$ A,**<br>**(e.g., quick charging power bank, etc.)** | | N/A |

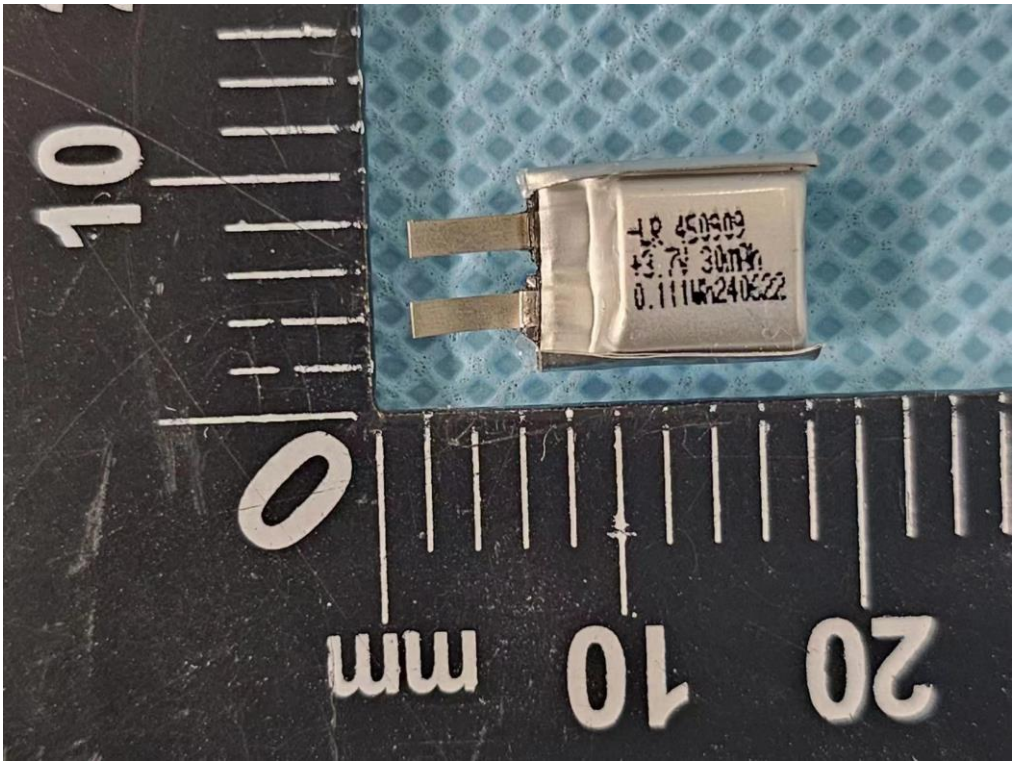
| ATTACHMENT to IEC62133_2C | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | ***[Replace to the following statement]***<br><br>c) Acceptance criteria<br>Filling beyond the manufacturer's specified limits should not result in ignition or explosion | | N/A |
| **Annex G** | **Definition for shape and materials of outer case for cell** | | — |
| *(Addition)* | G.1 General<br>Annex G provides definitions for shape and materials of outer case for cell<br><br>G.2 Shape of outer case for cell<br>G 2.1 Cylindrical cell<br>Cell with a cylindrical shape in which the overall height is equal to or greater than diameter.<br><br>G 2.2 Prismatic cell<br>Cell having the shape of a parallelepiped whose faces are rectangular<br><br>G.3 Materials of outer case for cell<br>G.3.1 Soft case<br>Non-metallic outer case or container for cell<br><br>G.3.2 Hard case<br>Metallic outer case or container for cell. | (Shape of outer cases)<br>☐ Cylindrical<br>☒ Prismatic<br><br>(Materials of outer cases)<br>☐ Hard<br>☒ Soft | — |
| **Annex H** | **Calculation method of the volumetric energy density for cell** | | — |
| *(Addition)* | Annex H provide a calculation method of the volumetric energy density for cell in use of smart phone, tablet, notebook.<br><br>H.1 General<br>Unless otherwise stated in the Annex E, the dimensions for calculation are based on these for cell before shipment and the volumetric energy density shall be calculated with a maximum values specified by manufacturer. If the specification for cell can't be provided a dimension for calculation, the manufacturer's other documentation shall be provided to demonstrate compliance for its calculation. | 223.2Wh/L | — |

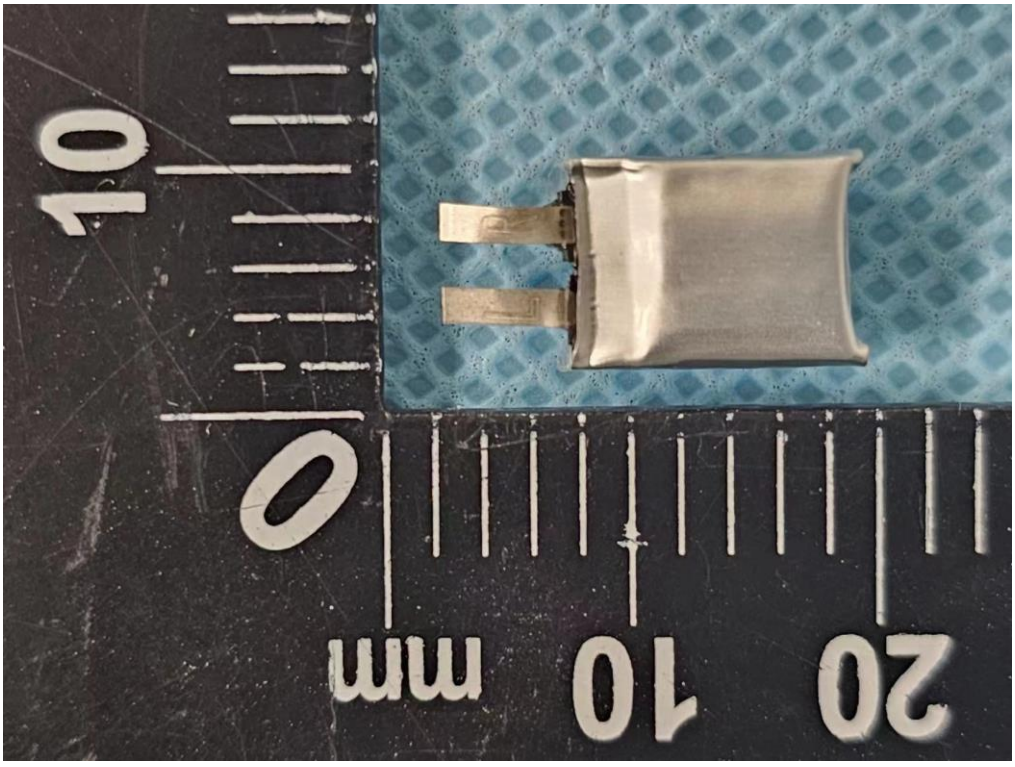
| ATTACHMENT to IEC62133_2C | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | H.2 Calculation Method<br>  <br><br>L : Length (max.) of cell (including terrace)<br>W : Width (max.) of cell<br>T : Thickness (max.) when shipping charge<br>(For reference, Please<br>Exclude the dimension of any tape that<br>Is attached to cell)<br>$Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{Length\ (L) \times Width\ (W)\ \times Thickness\ (T)}$<br>[H.1 – Prismatic cell using soft case]<br>  <br><br>L : Length (max.) of cell<br>W : Width (max.) of cell<br>T : Thickness when shipping charge<br>(For reference, Please<br>Exclude the dimension of any tape that<br>Is attached to cell)<br>$Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{Length\ (L) \times Width\ (W)\ \times Thickness\ (T)}$<br>[H.2 – Prismatic cell using hard case]<br>  <br><br>D : Diameter (max.) of cell<br>L : Length (max.) of cell<br>(According to shape of cell at shipping,<br>The dimension of tube for cell may be included<br>In overall dimension of cell )<br>$Volumetric\ energy\ density\ (Wh/L) = \frac{Nominal\ voltage\ (V) \times Rated\ capacity\ (Ah)}{3.14159 \times \frac{Diameter\ (D)^2}{4} \times Length(L)}$<br>[H.3 – Cylindrical cell using hard case] | | – |

## ENCLOSURES

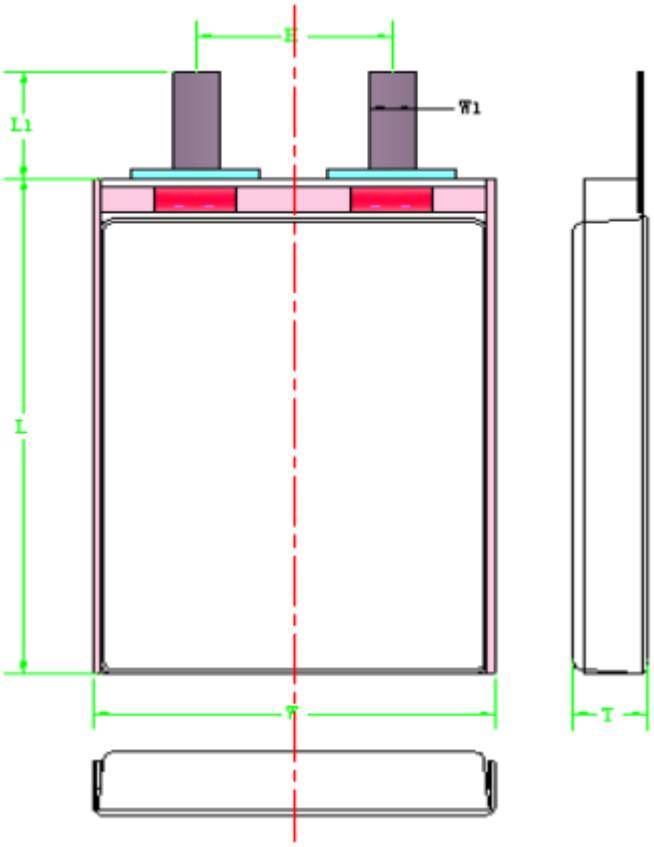
| Supplement ID | Description |
|---|---|
| 01 | Overall view of Li-ion Polymer Cell, Model 450909 |
| 02 | Assembly Drawing for Li-ion Polymer Cell, Model 450909 |
| 03 | Safety information and instruction for Li-ion Polymer Cell, Model 450909 |

ID 01



ID 02




| T | W | L |
|---|---|---|
| 4.7 Max. | 9.2 Max. | 11.5 Max. |

Cell (Unit: mm)

ID 03

**9. Warning and Cautions 警告及注意事项**

Danger warning (it should be described in manual or instruction for users, indicated especially) to prevent the possibility of the battery from leaking, heating, explosion. Please observe the following precautions:

危险警告：（应在使用说明手册或说明书中，特别注明）为防止电池可能发生泄漏，发热，爆炸，请注意以下预防措施：

Don't immerse the battery in water and seawater. Please put it in cool and dry environment if no using.

严禁将电池浸入海水或水中，保存不用时，应放置在阴凉干燥的环境中。

Do not discard or leave the battery near a heat source as fire or heater

禁止将电池在热高温源（如火、加热器）旁等使用、留置或丢入。

Being charged, using the battery charger specifically for that purpose

充电时请选用锂离子电池专用充电器。

Don't reverse the positive and negative terminals

严禁颠倒正负极使用电池。

Don't connect the battery to an electrical outlet directly.

严禁将电池直接接入电源插座。

Don't connect the positive and negative terminal directly with metal objects such as wire. Short terminals of battery is strictly prohibited, it may damage battery.

禁止用金属直接连接电池正负极短路，任何时候禁止短路电芯，它会导致电芯严重损坏。

Do not transport and store the battery together with metal objects such as necklaces, hairpins.

禁止将电池与金属，如发夹，项链等一起运输或贮存。

Do not strike , throw or trample the battery.

禁止敲击或抛掷，踩踏电池等。

Do not directly solder the battery and pierce the battery with a nail or other sharp object

禁止直接焊接电池和用钉子或其它利器刺穿电池。

Do not use lithium ion battery and others different lithium polymer battery model in mixture

禁止与液态锂离子或不同型号的聚合物锂电池混合使用

Prohibition of use of damaged cells

禁止使用已损坏的电芯

Don't bend or fold sealing edge. Don't open or deform folding edge Don't fillet the end of the folding edge

禁止弯折顶封边，禁止打开或破坏折边，禁止导折电芯折边底部

Don't fall, hit, bend battery body.

禁止坠落、冲击、弯折电芯。

Battery pack designing and packing Prohibition injury batteries.

电池外壳设计和包装禁止损伤电池。

Never disassemble the cells

在任何情况下不得拆卸电芯

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

更换电芯应由电芯供应商或设备供应商完成，用户不得自行更换。

Keep the battery away from babies.

电池应远离小孩.