Test Report No:	*Page 1of XX* *Issue Date: DD/MM/YYYY*

Manufacturer:	**Applicant's Name** Applicant's address		
Test item:	**(Secondary Battery)**		
Identification:		*Serial No.:*	**----**
Receipt No.:	**----**	*Date of receipt:*	
Testing laboratory and its address:			
Test specification:	IS 16046 (Part 2):2018 / IEC 62133-2:2017		
Test Result:	*The test item passed / failed the test specification(s).*		
Other Aspects:	*Brief description or additional details could be given by the labs here.*		
This test report relates to the test sample submitted and list of documents attached.			

Tested by:	**Approved by / Authorized Signatory:**	**Issued by:**
(Name / Designation)	**(Name / Designation)**	**(Name / Designation)**
Date:	**Date:**	**Date:**

[LAB LOGO]

TEST REPORT

IS 16046 (Part 2):2018 / IEC 62133-2:2017

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 Reference No..... :	
Date of issue ..... :	(see cover page)
Total number of pages	(see cover page)
Testing Laboratory ..... :	
Address ..... :	
Manufacturer's name ..... :	Factory Name
Address ..... :	Factory address
Test specification:	
Standard ..... :	IS 16046 (Part 2):2018 / IEC 62133-2:2017
Test procedure ..... :	BIS Compliance Report
Non-standard test method.....:	N/A
Test Report Form No..... :	**BIS_BAT/SCAB_IS16046(PART2)_V1.0**
Test Report Form(s) Originator ..... :	**Bureau of Indian Standards**
Master TRF ..... :	**10.01.2019**
Test item description ..... :	**(Secondary Cell)**
Trade Mark..... :	
Model/Type reference ..... :	
Ratings ..... :	
Other Documents submitted ..... :	Please refer to Table – List of Attachments at Page No. xx

Tested by:	**Approved by / Authorized Signatory:**	**Issued by:**
(Name / Designation)	**(Name / Designation)**	**(Name / Designation)**
Date:	**Date:**	**Date:**

Description	Measurement/ testing	Total No. of tests	Total no. of applicable tests/ Req.	No. of tests/ Req. passed	Page No.
General Requirements	Parameter measurement tolerances				
General safety considerations	Insulation and wiring				
General safety considerations	Venting				
General safety considerations	Temperature/voltage/Current management				
General safety considerations	Terminal contacts				
General safety considerations	Assembly of cells into batteries				
General safety considerations	Quality plan				
General safety considerations	Battery safety components				
Type test and sample size	Type test conditions				
Specific requirements and tests	Charging procedure for test purposes				
Specific requirements and tests	Intended use				
Specific requirements and tests	Reasonably foreseeable misuse				
Information for safety	Information for safety				
Marking Requirements	Marking				
Packaging and Transport	Packaging				
Charging and discharging range of secondary lithium ion cells for safe use	Charging and discharging range of secondary lithium ion cells for safe use (Annex A)				
Measurement of the internal AC resistance for coin cells	Measurement of the internal AC resistance for coin cells (Annex D)				

Certificate: It is certified that the above tests were performed and found to be passing/Failing in the requirement tested.

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(Approving Authority)

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

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment – 1		
Attachment – 2		
Attachment – 3		
Attachment – 4		
Attachment – 5		
Attachment – 6		

Copy of Marking Plate:

Test item particulars..... :	
Classification of installation and use ..... :	
Supply Connection ..... :	
Recommend charging method declared by the manufacturer..... :	
Discharge current (0,2 It A) ..... :	
Specified final voltage..... :	
Upper limit charging voltage per cell ..... :	
Maximum charging current ..... :	
Charging temperature upper limit ..... :	
Charging temperature lower limit ..... :	
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.....:	
Date (s) of performance of tests.....:	

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.

Laboratory Conditions

Ambient Temperature..... :

Ambient Humidity..... :

General product information:

1) Application details / Description of the product:

Max. specified ambient temperature (°C)..... :

Laser classification .... : < delete this line, if not applicable >

2) Differences between the models:

(N/A, one single model)

<OR>

< describe the constructional differences in such general terms, that the informed reader can still make a rough evaluation of their safety relevance >

Model No. tested with-in the family series . :

3) Options:

The following (optional) accessories are included in this test report:

<OR>

The equipment was tested without any optional accessory installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory that might affect safety in the meaning of this standard.

Clause	Requirement + Test	Result - Remark	Verdict
4	**PARAMETER MEASUREMENT TOLERANCES**		
	Parameter measurement tolerances		

Total number of Requirements to be observed / inspected =
Total No of applicable Requirement =
No of Requirements for which the sample passed:
Total number of tests to be conducted :
Total No of applicable Tests =
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Clause	Requirement + Test	Result - Remark	Verdict
5	**GENERAL SAFETY CONSIDERATIONS**		
5.1	**General**		
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		
5.2	**Insulation and wiring**		
	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		
	Insulation resistance (MΩ)..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		
	Orientation of wiring maintains adequate clearance and creepage distances between conductors		
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		

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Clause	Requirement + Test	Result - Remark	Verdict
5.3	**Venting**		
	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		
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		

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Clause	Requirement + Test	Result - Remark	Verdict
5.4	**Temperature, voltage and current management**		
	Batteries are designed such that abnormal temperature rise conditions are prevented		
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		
	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		

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Clause	Requirement + Test	Result - Remark	Verdict
5.5	**Terminal contacts**		
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		
	Terminal contacts are arranged to minimize the risk of short-circuit		

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Clause	Requirement + Test	Result - Remark	Verdict
5.6	**Assembly of cells into batteries**		
5.6.1	General		
	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		
	This protection may be provided external to the battery such as within the charger or the end devices		
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		
	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		
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		
	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		
	Protective circuit components added as appropriate and consideration given to the end-device application		
	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		
5.6.2	Design recommendation		
	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		
	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		

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 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		
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		
	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		
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage		
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		
5.6.3	Mechanical protection for cells and components of batteries		
	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		
	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		
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		

Clause	Requirement + Test	Result - Remark	Verdict

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Clause	Requirement + Test	Result - Remark	Verdict
5.7	**Quality plan**		
	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		

Total number of Requirements to be observed / inspected =
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Clause	Requirement + Test	Result - Remark	Verdict
5.8	**Battery safety components**		
	According annex F		

Total number of Requirements to be observed / inspected =
Total No of applicable Requirement =
No of Requirements for which the sample passed:
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Clause	Requirement + Test	Result - Remark	Verdict
6	**TYPE TEST AND SAMPLE SIZE**		
	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		
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1		
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C		
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		
	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		

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(Approving Authority

Clause	Requirement + Test	Result - Remark	Verdict
7	**SPECIFIC REQUIREMENTS AND TESTS**		
7.1	**Charging procedure for test purposes**		
7.1.1	First procedure		
	This charging procedure applies to subclauses other than those specified in 7.1.2		
	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		
	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		
7.1.2	Second procedure		
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, 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 voltage charging method		

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Clause	Requirement + Test	Result - Remark	Verdict
7.2	**Intended use**		
7.2.1	Continuous charging at constant voltage (cells)		
	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		
	Results: No fire. No explosion. No leakage..... :	(See appended table 7.2.1)	
7.2.2	Case stress at high ambient temperature (battery)		
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		

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Clause	Requirement + Test	Result - Remark	Verdict
7.3	**Reasonably foreseeable misuse**		
7.3.1	External short-circuit (cell)		
	The cells were tested until one of the following occurred:		
	- 24 hours elapsed; or		
	- The case temperature declined by 20 % of the maximum temperature rise		
	Results: No fire. No explosion.....:	(See appended table 7.3.1)	
7.3.2	External short-circuit (battery)		
	The batteries were tested until one of the following occurred:		
	- 24 hours elapsed; or		
	- The case temperature declined by 20 % of the maximum temperature rise		
	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		
	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		
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		
	Results: No fire. No explosion.....:	(See appended table 7.3.2)	
7.3.3	Free fall		
	Results: No fire. No explosion		
7.3.4	Thermal abuse (cells)		
	Oven temperature (°C) ..... :		—
	Results: No fire. No explosion		
7.3.5	Crush (cells)		
	The crushing force was released upon:		
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		
	- An abrupt voltage drop of one-third of the original voltage has been obtained		
	Results: No fire. No explosion.....:	(See appended table 7.3.5)	
7.3.6	Over-charging of battery		

Clause	Requirement + Test	Result - Remark	Verdict
	The supply voltage which is:		
	- 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		
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		
	Test was continued until the temperature of the outer casing:		
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		
	- Returned to ambient		
	Results: No fire. No explosion.....:	(See appended table 7.3.6)	
7.3.7	Forced discharge (cells)		
	If 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		
	If 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		
	Results: No fire. No explosion.....:	(See appended table 7.3.7)	
7.3.8	Mechanical tests (batteries)		
7.3.8.1	Vibration		
	Results: No fire, no explosion, no rupture, no leakage or venting. .....:	(See appended table 7.3.8.1)	
7.3.8.2	Mechanical shock		
	Results: No leakage, no venting, no rupture, no explosion and no fire.....:	(See appended table 7.3.8.2)	
7.3.9	Design evaluation – Forced internal short-circuit (cells)		
	The cells complied with national requirement for..... :	France, Japan, Korea, Switzerland	—
	The pressing was stopped upon:		
	- A voltage drop of 50 mV has been detected; or		

Clause	Requirement + Test	Result - Remark	Verdict
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		
	Results: No fire.....:	(See appended table 7.3.9)	

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Clause	Requirement + Test	Result - Remark	Verdict
8	**INFORMATION FOR SAFETY**		
8.1	**General**		
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products		
	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		
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		
	Do not allow children to replace batteries without adult supervision		
8.2	**Small cell and battery safety information**		
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		
	- Keep small cells and batteries 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 or battery, seek medical assistance promptly		

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Clause	Requirement + Test	Result - Remark	Verdict
9	**MARKING**		
9.1	**Cell marking**		
	Cells marked as specified in IEC 61960, except coin cells		
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		
	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		
9.2	**Battery marking**		
	Batteries marked as specified in IEC 61960, except for coin batteries		
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement		
	Terminals have clear polarity marking on the external surface of the battery		
	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		
9.3	**Caution for ingestion of small cells and batteries**		
	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		
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		
9.4	**Other information**		
	Storage and disposal instructions		
	Recommended charging instructions		

Clause	Requirement + Test	Result - Remark	Verdict

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Clause	Requirement + Test	Result - Remark	Verdict
10	**PACKAGING AND TRANSPORT**		
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		

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Clause	Requirement + Test	Result - Remark	Verdict
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		
A.1	**General**		
A.2	**Safety of lithium ion secondary battery**		
A.3	**Consideration on charging voltage**		
A.3.1	General		
A.3.2	Upper limit charging voltage		
A.3.2.1	General		
A.3.2.2	Explanation of safety viewpoint		
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		
A.4	**Consideration of temperature and charging current**		
A.4.1	General		
A.4.2	Recommended temperature range		
A.4.2.1	General		
A.4.2.2	Safety consideration when a different recommended temperature range is applied		
A.4.3	High temperature range		
A.4.3.1	General		
A.4.3.2	Explanation of safety viewpoint		
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		
A.4.4	Low temperature range		
A.4.4.1	General		
A.4.4.2	Explanation of safety viewpoint		
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		
A.4.5	Scope of the application of charging current		
A.4.6	Consideration of discharge		
A.4.6.1	General		
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		

Clause	Requirement + Test	Result - Remark	Verdict
A.4.6.3	Discharge current and temperature range		
A.4.6.4	Scope of application of the discharging current		
A.5	**Sample preparation**		
A.5.1	General		
A.5.2	Insertion procedure for nickel particle to generate internal short		
A.5.3	Disassembly of charged cell		
A.5.4	Shape of nickel particle		
A.5.5	Insertion of nickel particle in cylindrical cell		
A.5.5.1	Insertion of nickel particle in winding core		
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		
A.5.6	Insertion of nickel particle in prismatic cell		
A.6	**Experimental procedure of the forced internal short-circuit test**		
A.6.1	Material and tools for preparation of nickel particle		
A.6.2	Example of a nickel particle preparation procedure		
A.6.3	Positioning (or placement) of a nickel particle		
A.6.4	Damaged separator precaution		
A.6.5	Caution for rewinding separator and electrode		
A.6.6	Insulation film for preventing short-circuit		
A.6.7	Caution when disassembling a cell		
A.6.8	Protective equipment for safety		
A.6.9	Caution in the case of fire during disassembling		
A.6.10	Caution for the disassembling process and pressing the electrode core		
A.6.11	Recommended specifications for the pressing device		

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(Approving Authority

Clause	Requirement + Test	Result - Remark	Verdict
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		

Clause	Requirement + Test	Result - Remark	Verdict
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		
D.1	**General**		
D.2	**Method**		
	A sample size of three coin cells is required for this measurement.....:	(See appended table D.2)	
	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		
	Coin cells with an internal resistance greater than 3 Ω require no further testing		

Total number of Requirements to be observed / inspected =
Total No of applicable Requirement =
No of Requirements for which the sample passed:
Total number of tests to be conducted :
Total No of applicable Tests =
No. of tests for which the sample passed:

Certificate: It is certified that the above tests were performed and found to be passing/failing in the requirement tested.

.....
(Approving Authority

ANNEX E	**PACKAGING AND TRANSPORT**	

ANNEX F	**COMPONENT STANDARDS REFERENCES**	

	TABLE: Critical components information				
Object / part No.	**Manufacturer / trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Insulation					
- Insulation tape					
- Insulation sheet					
Internal wiring					
Encapsulation					
- Enclosure					
- Jacket					
Temperature/current management devices, protective circuit components					
- CID					
- Fuse					
- PTC					
- Control IC					
- FET					
- MOSFET					
Terminal contacts					
Terminal insulation					
Cells					
- Electrolyte					
- Separator					
- Anode					
- Cathode					
Supplementary information:					

7.2.1	TABLE: Continuous charging at constant voltage (cells)			
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Others (please explain)

7.3.1	TABLE: External short-circuit (cell)				
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Results**
Samples charged at charging temperature upper limit					
Samples charged at charging temperature lower limit					

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.2	TABLE: External short-circuit (battery)					
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:

- No fire or explosion
- Others (please explain)

7.3.5	TABLE: Crush (cells)			
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				

Supplementary information:

- No fire or explosion
- Others (please explain)

7.3.6	TABLE: Over-charging of battery	
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:
- No fire or explosion
- Others (please explain)

7.3.7	TABLE: Forced discharge (cells)			

Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I_t (A)	Lower limit discharge voltage (Vdc)	Results

Supplementary information:
- No fire or explosion
- Others (please explain)

7.3.8.1	TABLE: Vibration				

Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results

Supplementary information:
- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.8.2	TABLE: Mechanical shock				
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**

Supplementary information:

- No fire or explosion
- No rupture
- No leakage
- No venting
- Others (please explain)

7.3.9	TABLE: Forced internal short circuit (cells)				
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					
Samples charged at charging temperature lower limit					

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 or explosion
- Others (please explain)

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

Supplementary information:

[1)] Coin cells with internal resistance less than or equal to 3 Ω, see test result on corresponding tables

ATTACHMENT

Enclosures

Supplement Id	Description
01	
02	
03	
04	
05	
06	

01

02

03

04

05

06