

SUMMARY OF TEST REPORT

TEST REPORT NO...170920019/170920019-1...DATED 25/10/2017
(Number of pages in test report: page no. 1 to 49)

TEST FORMAT AS PER IS 16046:2015 /IEC 62133:2012

1. Name of Manufacturer: Shenzhen Hui Jin Long Trading Co.,Ltd.
12F,oversea friendship building,Yingchun road,Luohu area,shenzhen,P.R,China.
- 2 Item: Li-ion Polymer Battery
- 3 Model(s) : 502030
- 4 Model differences provided (if applicable) : N/A
- 5 Model differences verified as per DEITY Guidelines for series formulation : N/A
- 6 Test Results :

SL. NO.	TEST REQUIREMENT	CLAUSE	VERDICT
1.	Parameters measurement tolerances	4.0	P
2.	Insulation and wiring	5.2	P
3.	Venting	5.3	P
4.	Temperature/Current management	5.4	P
5.	Terminal contacts	5.5	P
6.	Assembly of cells into Batteries	5.6	N/A
7.	Quality Plan	5.7	P
8.	Type test conditions	6.0	P
9.	Charging procedure for test purpose	7.1	N/A
10.	Intended use	7.2	N/A
11.	Reasonably foreseeable misuse	7.3	N/A
12.	Charging procedure for test purpose	8.1	P
13.	Intended use	8.2	P
14.	Reasonably foreseeable misuse	8.3	P
15.	Information of safety	9.0	P
16.	Cell marking	10.1	N/A
17.	Battery marking	10.2	P
18.	Other information	10.3	P
19.	Packaging	11.0	P
20.	Charging range of secondary lithium ion cells for safe use	Annex A	P

General Information:

1.The conformity certificates of critical components are verified to ensure complete testing of apparatus under test and details regarding harmonized IEC standards/harmonized IEC standards are also provided in the list of critical component.

CONCLUSION :

- 1) Sample meets all relevant requirements of IS 16046:2015/IEC 62133:2012. v

Remarks:

1. P:Pass; F: Fail; N/A: Not applicable

I, hereby, undertake that the verdict stated in the test reports for all the tests matches with the test results. The sample meets all relevant requirements of IS 16046:2015/IEC 62133:2012.If any deviation is found, suitable punitive action may be taken by BIS.

Jagatpal
Tested By

[Signature]
Authorized Signatory
SPECTRO ANALYTICAL LABS LIMITED
GREATER NOIDA

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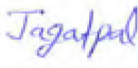
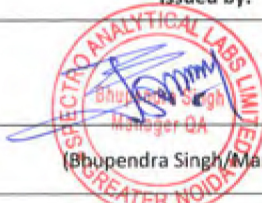
Issue Date: 25/10/2017

Manufacturer:	Shenzhen Hui Jin Long Trading Co.,Ltd. 12F,oversea friendship building,Yingchun road,Luohu area,shenzhen,P.R,China.		
Test item:	Li-ion Polymer Battery		
Identification:	502030	Serial No.:	Nil
Receipt No.:	170920019	Date of receipt:	13/10/2017
Testing laboratory and its address:	SPECTRO ANALYTICAL LABS LIMITED S-1,GNEPIP,SURAJPUR INDUSTRIAL AREA PHASE-5,KASNA,GREATER NOIDA-201308		
Test specification:	IS 16046:2015 /IEC 62133:2012		
Test Result:	The test item passed the test specification(s).		
Other Aspects:	1. P = Pass, F = Fail, N/A = Not Applicable This test report relates to the test sample submitted and list of documents attached.		

Tested by:	Approved by / Authorized Signatory:	Issued by:
		
(Jagatpal/Engineer)	(Bhupendra Singh/Manager QA)	(Bhupendra Singh/Manager QA)
Dated: 25/10/2017	Dated: 25/10/2017	Dated: 25/10/2017

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TEST REPORT	
IS 16046:2015 / IEC 62133:2012	
Secondary Cells and Batteries containing Alkaline or other non-acid Electrolyte- Safety Requirements for Portable Sealed Secondary Cells and for Batteries made from them, for use in Portable Application "Sealed Secondary Cells/Batteries containing Alkaline or other non-acid Electrolyte for use in Portable Applications"	
Report Reference No.....	170920019/170920019-1
Date of issue.....	25/10/2017
Total number of pages.....	49
Testing Laboratory.....	SPECTRO ANALYTICAL LABS LIMITED
Address.....	S-1,GNEPIP,SURAJPUR INDUSTRIAL AREA PHASE-5,KASNA,GREATER NOIDA-201308
Manufacturer's name.....	Shenzhen Hui Jin Long Trading Co.,Ltd.
Address.....	12F,oversea friendship building,Yingchun road,Luohu area,shenzhen,P.R.China.
Test specification:	
Standard.....	IS 16046:2015 / IEC 62133:2012
Test procedure.....	Compliance Report
Non-standard test method.....	N/A
Test Report Form No.....	BIS_BAT/SCAB_IS16046_V2.0
Test Report Form(s) Originator.....	Bureau of Indian Standards
Master TRF.....	18/03/2016
Test item description.....	Li-ion Polymer Battery
Trade Mark.....	SHENZHEN TOP ENERGY CO., LTD.
Model/Type reference.....	502030
Ratings.....	3.7V, 250mAh, 0.925Wh
Other Documents submitted.....	Please refer to Table – List of Attachments at Page No. 41

Tested by:	Approved by / Authorized Signatory:	Issued by:
		
(Jagatpal/Engineer)	(Bhupendra Singh/Manager QA)	(Bhupendra Singh/Manager QA)
Dated: 25/10/2017	Dated: 25/10/2017	Dated: 25/10/2017

BIS_BAT/SCAB_IS16046_V2.0

Address: S-1, GNEPIP Surajpur Industrial Area, Phase-V, Kasna, Greater Noida-201308 (India)
Phone: +91-0120-2341251, 2341252, Email: care@spectro.in, URL: www.spectrogroup.com

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Test Code	Description	Measurement/ testing	Total No. of tests	Total no. of applicable tests/ Req.	No. of tests/ Req. passed	Page No.
EL 2700	General Requirements	Parameter measurement tolerances (Cl. 4)	01	01	01	08
EL 2701	General safety considerations	Insulation and wiring (Cl. 5.2)	07	02	02	09
EL 2702	General safety considerations	Venting (Cl. 5.3)	03	03	03	10
EL 2703	General safety considerations	Temperature/voltage/Current management (Cl. 5.4)	04	04	04	11
EL 2704	General safety considerations	Terminal contacts (Cl. 5.5)	05	05	05	12
EL 2705	General safety considerations	Assembly of cells into batteries (Cl.5.6)	12	00	N/A	13
EL 2706	General safety considerations	Quality plan (Cl. 5.7)	02	02	02	15
EL 2707	Electrical safety	Type test conditions (Cl. 6.0)	03	03	03	16
EL 2708	Electrical safety	Charging procedure for test purposes (Cl. 7.1)	02	00	N/A	17
EL 2709	Electrical safety	Intended use (Cl. 7.2)	19	00	N/A	18
EL 2710	Electrical safety	Reasonably foreseeable misuse (Cl. 7.3)	44	00	N/A	20
EL 2711	Electrical safety	Charging procedure for test purposes (Cl. 8.1)	08	08	08	25
EL 2712	Electrical safety	Intended use (Cl. 8.2)	09	05	05	27
EL 2713	Electrical safety	Reasonably foreseeable misuse (Cl. 8.3)	45	20	20	29
EL 2714	General Requirements	Information for Safety (Cl. 9)	04	03	03	34
EL 2715	Marking Requirements	Cell marking (Cl. 10.1)	03	00	N/A	35
EL 2716	Marking Requirements	Battery marking (Cl. 10.2)	03	03	03	36
EL 2717	Marking Requirements	Other information (Cl. 10.3)	03	03	03	37
EL 2718	Mechanical properties	Packaging (Cl. 11.0)	02	02	02	38
EL 2719	Electrical safety	Charging range of secondary lithium ion cells for safe use	Annex A	14	14	39

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

(Approving Authority)

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Table – List of Attachments

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment – 1	Photographs	01

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.



Copy of marking plate:

Li-ion Polymer Battery
502030 3.7V 250mAh
0.925Wh 20170803
Red Wire: +
Black Wire: -
1ICP5/21/31
Made in China

Shenzhen Hui Jin Long
Trading Co., Ltd.

**Caution: Do not use
batteries after water
immersion**



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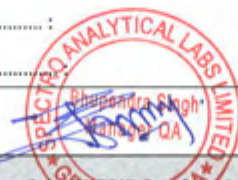
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Test items particulars..... :	Li-ion Polymer Battery
Classification of installation and use..... :	Class III & used in the portable application
Supply connection..... :	Not directly connected to mains
Recommended charging method declared by the manufacturer..... "	CC/CV
Discharge current (0,2 I _A)..... :	0.05A
Specified final voltage..... :	4.2V
Specified charging period..... :	Maximum 4hours
Specified charging rate..... :	125mA
Specified final discharge voltage..... :	3.0V
Chemistry	☐ nickel systems..... ☒ lithium systems
Recommended charging limit for lithium system	
Upper limit charging voltage per cell..... :	4.2V
Maximum charging current..... :	250mA
Charging temperature upper limit..... :	45°C
Charging temperature lower limit	10°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..... :	13/10/2017
Date (s) of performance of tests..... :	13/10/2017 to 23/10/2017
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.	
Throughout this report a "," comma / "." point is used as the decimal separator.	
Laboratory Conditions	
Ambient Temperature	(20 ± 5)°C
Ambient Humidity	(60 ± 15)% RH

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General product information:

1) Application details / Description of the product:

Item: Li-ion Polymer Battery
Brand Name: Shenzhen Hui Jin Long Trading Co.,Ltd.
Model: 502030
Rating: 3.7V, 250mAh, 0.925Wh
Dimensions: H= 30.52mm, W= 19.55mm, T= 4.90mm
Weight: 0.006Kg

Charging Specification:-

Model	Charging Voltage (Vdc)	Standard Charging Current (mA)	Maximum Charging Current (mA)	Discharging Current (mA)	End Discharge Voltage (Vdc)
502030	4.2	125	250	50	3.0

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

Charging Temperature(10°C~45°C), Discharging Temperature(-20°C~60°C)

Differences between the models: N/A

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

N/A

3) Options: N/A



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Tests relating to General Requirements

EL 2700 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
4	Parameter measurement tolerances*	EL 2700-00	All controlled and measured values were within the tolerances.	P

*- Total number of Requirements to be observed / inspected = 01

Total No of applicable Requirement = 01

No of Requirements for which the sample passed: 01

Total number of tests to be conducted : 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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



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Tests relating to General requirements

EL 2701 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5	General Safety Considerations*	EL 2701-00	See below	P
5.1	General*	EL 2701-01	The battery is safe and Continue to function in all respect of its intended use, the battery is safe and does not present significant Hazards under the condition of reasonably foreseeable misuse	P
5.2	Insulation and Wiring	EL 2701-02		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 at 500V d.c when measured 60 s after applying the voltage.	EL 2701-03		N/A
	Insulation resistance (MΩ):			N/A
	Internal wiring and its insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements	EL 2701-04		N/A
	Orientation of wiring maintains adequate creepage and clearance distances between connectors	EL 2701-05		N/A
	Mechanical integrity of internal connections accommodates conditions of reasonably foreseeable misuse	EL 2701-06		N/A

*-Total number of Requirements to be observed / inspected = 02

Total No of applicable Requirement =02

No of Requirements for which the sample passed: 02

Total number of tests to be conducted : 05

Total No of applicable Tests = 00

No. of tests for which the sample passed:N/A

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

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Tests relating to General requirements

EL 2702 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5.3	Venting*	EL 2702-00	See below	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	EL 2702-01	Satisfactory	P
	Encapsulation used to support cells within an outer casing neither cause the battery to overheat during normal operation nor inhibit pressure relief	EL 2702-02	Satisfactory	P

*- Total number of Requirements to be observed / inspected = 01

Total No of applicable Requirement = 01

No of Requirements for which the sample passed: 01

Total number of tests to be conducted : 02

Total No of applicable Tests = 02

No. of tests for which the sample passed: 02

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


.....
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Tests relating to General requirements

EL 2703 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5.4	Temperature/voltage/current management	EL 2703-00	See below	P
	Batteries are designed such that abnormal temperature rise conditions are prevented	EL 2703-01	Batteries are designed with abnormal temperature rise protection	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	EL 2703-02	Overcharge, over-discharge, over current and short circuit proof circuit used in the battery	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	EL 2703-03	Satisfactory	P

*- Total number of Requirements to be observed / inspected = 00

Total No of applicable Requirement = 00

No of Requirements for which the sample passed: N/A

Total number of tests to be conducted : 04

Total No of applicable Tests = 04

No. of tests for which the sample passed: 04

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



 Bupendra Singh

 Manager QA

 (Approving Authority)

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Tests relating to General requirements

EL 2704 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5.5	Terminal Contacts*	EL2704-00	See below	P
	Terminals have a clear polarity marking on the external surface of the battery.*	EL2704-01	Clear marking provided on external surface of battery.	P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current.*	EL2704-02	Complied	P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance.*	EL2704-03	Complied	P
	Terminal contacts are arranged to minimize the risk of short circuits.*	EL2704-04	Complied	P

*- Total number of Requirements to be observed / inspected = 05

Total No of applicable Requirement = 05

No of Requirements for which the sample passed: 05

Total number of tests to be conducted : 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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



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Tests relating to General requirements

EL 2705 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5.6	Assembly of cells into batteries *	EL 2705-00	See Below	N/A
5.6.1	General*	EL 2705-01		N/A
	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer.*	EL 2705-02	No such construction is used	N/A
	Each battery has an independent control and protection.*	EL 2705-03	As above	N/A
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly.*	EL 2705-04	As above	N/A
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges.*	EL 2705-05	As above	N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application.*	EL 2705-06	As above	N/A
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard.*	EL 2705-07	As above	N/A
5.6.2	Design recommendation for lithium systems only.*	EL 2705-08	As above	N/A
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 4; or*	EL 2705-09	As above	N/A

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For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 4, by monitoring the voltage of every single cell or the single cellblocks; or*	EL 2705-10	As above	N/A
For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or*	EL 2705-11	As above	N/A

*- Total number of Requirements to be observed / inspected = 12

Total No of applicable Requirement = 00

No of Requirements for which the sample passed: N/A

Total number of tests to be conducted : 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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

(Approving Authority)

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Tests relating to General requirements

EL 2706 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
5.7	Quality Plan*	EL 2706-00	See below	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.*	EL 2706-01	ISO 9000 or 9001 provided	P

*- Total number of Requirements to be observed / inspected = 02

Total No of applicable Requirement =02

No of Requirements for which the sample passed: 02

Total number of tests to be conducted : 00

Total No of applicable Tests =00

No. of tests for which the sample passed: N/A

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

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Tests relating to Electrical Safety

EL 2707 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
6	Type test conditions*	EL 2707-00	See below	P
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old.*	EL 2707-01	Complied	P
	Unless specified otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.*	EL 2707-02	Considered and evaluated for the batteries	P

*- Total number of Requirements to be observed / inspected = 03

Total No of applicable Requirement = 03

No of Requirements for which the sample passed: 03

Total number of tests to be conducted = 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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


.....
(Approving Authority)

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Tests relating to Electrical Safety

EL 2708 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
7	Specific requirements and tests (nickel systems)*	EL 2708-00	Considered only for nickel system	N/A
7.1	Charging procedure for test purposes	EL 2708-01	See above	N/A

*- Total number of Requirements to be observed / inspected = 01

Total No of applicable Requirement = 00

No of Requirements for which the sample passed:N/A

Total number of tests to be conducted : 01

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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

(Approving Authority)

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Tests relating to Electrical Safety

EL 2709 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
7.2	Intended Use*	EL 2709-00	See below	N/A
7.2.1	Continuous low-rate charging (cells)*	EL 2709-01	This is not a Nickel system	N/A
	a) Requirement		As above	N/A
	A Continuous Low Rate Charge shall not cause fire or explosion*	EL 2709-02	As above	N/A
	b) Test		As above	N/A
	Fully charged cells are subjected for 28 days to a charge as specified by the manufacturer.	EL 2709-03	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion*	EL 2709-04	As above	N/A
7.2.2	Vibration	EL 2709-05	See below	N/A
	a) Requirements		This is not a Nickel system	N/A
	Vibration encountered during transportation shall not cause leakage, fire or explosion*	EL 2709-06	As above	N/A
	b) Test		As above	N/A
	Fully charged cells or batteries are vibration tested under test conditions and sequence as given at Table 3. A simple harmonic motion was applied to cells/batteries with an amplitude of 0.76 mm and a total maximum excursion of 1.52 mm. The frequency was varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz. The entire range of frequencies (10 Hz to 55 Hz) and return (55 Hz to 10 Hz) was traversed in 90 min ± 5 min for each mounting position (direction of vibration).	EL 2709-07	As above	N/A
	The vibration was applied as per Table 3 in each of three mutually perpendicular directions in the sequence specified. The cell was then rested for one hour and visual inspection made.	EL 2709-08	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion, no leakage*	EL 2709-09	As above	N/A
7.2.3	Moulded case stress at high ambient temperature (batteries)	EL 2709-10	See below	N/A

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	a) Requirements:		This is not a Nickel system	N/A
	Internal components of batteries shall not be exposed during use at high temperature*	EL 2709-11	As above	N/A
	b) Test:		As above	N/A
	Fully charged batteries were placed in an air-circulating oven at a temperature of 70°C ± 2°C for 7 hours. Afterwards, they are removed and allowed to return to room temperature.	EL 2709-12	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no physical distortion of the battery casing resulting in exposure if internal components.*	EL 2709-13	As above	N/A
7.2.4	Temperature cycling	EL 2709-14	See below	N/A
	a) Requirements:		This is not nickel system	N/A
	Repeated exposure to high and low temperature shall not cause fire or explosion*	EL 2709-15	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells or batteries were subjected to temperature cycling (-20°C, +75°C) in forced draught chambers according to the procedure and profile outlined in Fig. 1 for 7.2.4.	EL 2709-16	As above	N/A
	After the fifth cycle, the cells or batteries were stored for 24 hrs prior to examination.	EL 2709-17	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: No fire, no explosion, no leakage*	EL 2709-18	As above	N/A

*- Total number of Requirements to be observed / inspected = 10

Total No of applicable Requirement = 00

No of Requirements for which the sample passed: N/A

Total number of tests to be conducted : 09

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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

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EL 2710 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
7.3	Reasonably foreseeable misuse*	EL 2710-00	See below	N/A
7.3.1	Incorrect installation (cells)*	EL 2710-01	This is not nickel system	N/A
	a) Requirements:		As above	N/A
	The incorrect installation of a single cell in a multi-cell application shall not cause fire or explosion.*	EL 2710-02	As above	N/A
	b) Test:		As above	N/A
	Four fully charged cells of the same brand, type, size and age were connected in series with one of the four cells reversed. The resultant assembly was connected across a 1-ohm resistor until the vent opened or until the temperature of the reversed cell returned to ambient temperature.	EL 2710-03	As above	N/A
	Alternatively, a stabilized dc power supply was used to simulate the conditions imposed on the reversed cell.	EL 2710-04	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion*	EL 2710-05	As above	N/A
7.3.2	External Short circuit	EL 2710-06	See below	N/A
	a) Requirements:		This is not nickel system	N/A
	Short-circuiting of positive and negative terminal shall not cause fire or explosion.*	EL 2710-07	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells or batteries were subjected to a short circuit test at 20°C ± 5°C.	EL 2710-08	As above	N/A
	Fully charged cells or batteries were subjected to a short circuit test at 55°C ± 5°C.	EL 2710-09	As above	N/A
	The external resistance did not exceed 80 mΩ ± 20 mΩ.	EL 2710-10	As above	N/A
	The cells or batteries were tested for 24 h or until the	EL 2710-11	As above	N/A

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EL 2710 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	case temperature declined by 20% of the maximum temperature rise, whichever was sooner.			
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion.*	EL 2710-12	As above	N/A
7.3.3	Free fall	EL 2710-13	See below	N/A
	a) Requirements:		This is not nickel system	N/A
	Dropping of a cell or battery shall not cause fire or explosion*	EL 2710-14	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells or battery is dropped three times from a height of 1 m onto concrete floor so as to obtain impacts in random orientations. Then rest for minimum one hour.	EL 2710-15	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion*	EL 2710-16	As above	N/A
7.3.4	Mechanical shock (crash hazard)	EL 2710-17	See below	N/A
	a) Requirements:		As above	N/A
	Shocks encountered during handling or transportation shall not cause fire, explosion or leakage*	EL 2710-18	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells or batteries were subjected to a total of three shocks of equal magnitude applied in each of three mutually perpendicular directions. At least one of the directions was perpendicular to a flat face. During the initial 3 milliseconds, the minimum average acceleration was 75 g _n . The peak acceleration was between 125 g _n and 175 g _n . Then rest for minimum one hour.	EL 2710-19	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion, no leakage*	EL 2710-20	As above	N/A

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Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
7.3.5	Thermal abuse (cells)	EL 2710-21	See below	N/A
	a) Requirements:		This is not a nickel system	N/A
	An extremely high temperature shall not cause fire or explosion*	EL 2710-22	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells stabilized at room temperature were placed in a gravity or circulating air-convection oven. The oven temperature was raised at a rate of 5°C/min $\pm$ 2°C/min to a temperature of 130°C $\pm$ 2°C. The cell remained at that temperature for 10 minutes before the test was discontinued.	EL 2710-23	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion*	EL 2710-24	As above	N/A
7.3.6	Crushing of cells	EL 2710-25	See below	N/A
	a) Requirements:		This is not a nickel system	N/A
	Severe crushing of a cell shall not cause fire or explosion.*	EL 2710-26	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells were crushed between two flat surfaces with a hydraulic ram exerting a force of 13 kN $\pm$ 1 kN, the crushing performed in a manner that causes the most adverse result.	EL 2710-27	As above	N/A
	Once maximum force has been applied, or an abrupt voltage drop of one-third of the original voltage has been obtained, the force is released.	EL 2710-28	As above	N/A
	A cylindrical or prismatic cell was crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus.	EL 2710-29	As above	N/A
	A second set of prismatic cells was tested, rotated 90 degrees around their longitudinal axis compared to	EL 2710-30	As above	N/A

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EL 2710 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	the first set.			
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion.*	EL 2710-31	As above	N/A
7.3.7	Low pressure (cells)	EL 2710-32	See below	N/A
	a) Requirements:		This is not a nickel system	N/A
	Low pressure shall not cause fire or explosion*	EL 2710-33	As above	N/A
	b) Test:		As above	N/A
	Fully charged cells are placed in a vacuum chamber, in an ambient temperature of 20 °C±5°C. After sealing the chamber, internal pressure was gradually reduced to a pressure equal to or less than 11.6 kPa and held at that value for 6 hours.	EL 2710-34	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion, no leakage*	EL 2710-35	As above	N/A
7.3.8	Overcharge	EL 2710-36	See below	N/A
	a) Requirements:		This is not a Nickel system	N/A
	Charging for longer periods and at a higher rate than specified by the manufacturer shall not cause fire or explosion*	EL 2710-37	As above	N/A
	b) Test:		As above	N/A
	A discharged cell or battery was subjected to a high-rate charge of 2.5 times the recommended charging current for a time that produced 250% charge input (250% of rated capacity).	EL 2710-38	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion.*	EL 2710-39	As above	N/A
7.3.9	Forced discharge (cells)	EL 2710-40	See below	N/A
	a) Requirements:		This is not a Nickel system	N/A

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Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	A cell in a multi cell application shall withstand polarity reversal without causing fire or explosion.*	EL 2710-41	As above	N/A
	b) Test:		As above	N/A
	Discharged cells intended for use in multi-cell applications, were subjected to a reverse charge at 1 I _r A for 90 minutes.	EL 2710-42	As above	N/A
	c) Acceptance criteria:		As above	N/A
	Results: no fire, no explosion*	EL 2710-43	As above	N/A

*- Total number of Requirements to be observed / inspected = 20

Total No of applicable Requirement = 00

No of Requirements for which the sample passed: N/A

Total number of tests to be conducted : 24

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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

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Tests relating to Electrical Safety

EL 2711 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
8	Specific requirements and tests (lithium systems)*	EL 2711-00	See below	P
8.1	Charging Procedure for test purposes	EL 2711-01	In compliance	P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2	EL 2711-02	Except Procedure specified in Cl.no. 8.1.2, First procedure used	P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9	EL 2711-03	Second Procedure used for test of Clause 8.3.2	P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit	EL 2711-04	Charging temperature range declared by manufacturer is: 10°C to 45°C. The upper limit test temperature: 45°C The lower limit test temperature: 10°C	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) :	EL 2711-05	Complies	P
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4.25 V), the upper limit charging voltage and upper limit charging temperatures were adjusted accordingly to fulfil the criteria of the relevant clauses.	EL 2711-06	Upper limit Charging Voltage:4.2V	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) :	EL 2711-07	Complies	P



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*- Total number of Requirements to be observed / inspected = 01

Total No of applicable Requirement = 01

No of Requirements for which the sample passed: 01

Total number of tests to be conducted : 07

Total No of applicable Tests = 07

No. of tests for which the sample passed: 07

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


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Tests relating to Electrical Safety

EL 2712 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
8.2	Intended Use*	EL 2712-00	See below	P
8.2.1	Continuous charging at constant voltage (cells)*	EL 2712-01	Separately approved cell used (See table1)	N/A
	a) Requirement			N/A
	A continuous charge at constant voltage shall not cause fire or explosion.*	EL 2712-02		N/A
	b) Test			N/A
	Fully charged cells are subjected for 7 days to a charge as specified by the manufacturer.	EL 2712-03		N/A
	c) Acceptance criteria:			N/A
	Results: no fire, no explosion, no leakage*	EL 2712-04		N/A
8.2.2	Moulded case stress at high ambient temperature (battery)	EL 2712-05	See below	P
	a) Requirements:			P
	Internal components of batteries shall not be exposed during use at high temperature*	EL 2712-06	Battery not be exposed	P
	b) Test:			P
	Fully charged batteries as per the procedure in clause 8.1.1 were placed in an air-circulating oven at a temperature of 70°C ± 2°C for 7 hours. Afterwards, they are removed and allowed to return to room temperature.	EL 2712-07	Three batteries were fully charged as per Cl. 8.1.1	P
	c) Acceptance criteria:			P
	Results: no physical distortion of the battery casing resulting in exposure if internal components.*	EL 2712-08	No physical distortion of battery case	P



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*- Total number of Requirements to be observed / inspected = 06

Total No of applicable Requirement = 03

No of Requirements for which the sample passed: 03

Total number of tests to be conducted : 03

Total No of applicable Tests = 02

No. of tests for which the sample passed: 02

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


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Tests relating to Electrical Safety

EL 2713 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
8.3	Reasonably foreseeable misuse*	EL 2713-00	See below	P
8.3.1	External short circuit (cell)	EL 2713-01	Separately approved cell used (See table1)	N/A
	a) Requirements:			N/A
	Short-circuiting of the positive and negative terminals of the cell at ambient temperature shall not cause fire or explosion.*	EL 2713-02		N/A
	b) Test:			N/A
	Fully charged cells as per the procedure in clause 8.1.2 were subjected to a short circuit test.	EL 2713-03		N/A
	The external resistance did not exceed $80\text{ m}\Omega \pm 20\text{ m}\Omega$.	EL 2713-04		N/A
	The cells were tested for 24 h or until the surface temperature declined by 20% of the maximum temperature rise, whichever is sooner.	EL 2713-05		N/A
	c) Acceptance criteria:			N/A
	Results: no fire, no explosion.*	EL 2713-06		N/A
8.3.2	External short circuit (battery)	EL 2713-07	See below	P
	a) Requirements:			P
	Short-circuiting of the positive and negative terminals of the battery pack shall not cause fire or explosion.*	EL 2713-08	Not causing fire or explosion after short circuiting positive and negative terminal (See table 8.3.2)	P
	b) Test:			P
	Fully charged battery pack as per the procedure in clause 8.1.2 was subjected to a short circuit test at $55^\circ\text{C} \pm 5^\circ\text{C}$.	EL 2713-09	Ten fully charged Batteries tested for this condition at $55^\circ\text{C} \pm 5^\circ\text{C}$	P
	The external resistance did not exceed $80\text{ m}\Omega \pm 20\text{ m}\Omega$.	EL 2713-10	External resistance within $80\text{ m}\Omega \pm 20\text{ m}\Omega$.	P
	The battery pack was tested for 24 h or until the case temperature declined by 20% of the maximum	EL 2713-11	Batteries are tested for 24hrs	P

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EL 2713 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	temperature rise, whichever is sooner.			
	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	EL 2713-12	No such condition is observed	N/A
	c) Acceptance criteria:			P
	Results: no fire, no explosion.*	EL 2713-13	No fire, no explosion observed	P
8.3.3	Free fall	EL 2713-14	See below	P
	a) Requirements:			P
	Dropping of a cell or battery shall not cause fire or explosion*	EL 2713-15		P
	b) Test:			P
	Fully charged cell or battery as per the procedure in clause 8.1.1 is dropped three times from a height of 1m onto concrete floor so as to obtain impacts in random orientations. Then cell or battery was put on rest for minimum one hour and then visual inspection is performed.	EL 2713-16	Three fully charged batteries tested for this condition	P
	c) Acceptance criteria:			P
	Results: no fire, no explosion*	EL 2713-17	no fire, no explosion	P
8.3.4	Thermal abuse (cells)	EL 2713-18	See below	N/A
	a) Requirements:			N/A
	An extremely high temperature shall not cause fire or explosion*	EL 2713-19		N/A
	b) Test:			N/A
	Fully charged cells as per the procedure in clause 8.1.2 were placed in a gravity or circulating air-convection oven. The oven temperature was raised at a rate of 5°C/min ± 2°C/min to a temperature of 130°C ± 2°C. The cell remained at that temperature for 10 minutes.	EL 2713-20	Separately approved cell used (See table1)	N/A

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EL 2713 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	minutes for larger cells) before the test was discontinued.			
	c) Acceptance criteria:			N/A
	Results: no fire, no explosion*	EL 2713-21		N/A
8.3.5	Crush (cells)	EL 2713-22	See below	N/A
	a) Requirements:			N/A
	Severe crushing of a cell shall not cause fire or explosion.*	EL 2713-23		N/A
	b) Test:			N/A
	Fully charged cell, charged according to second procedure at the upper limit charging temperature in clause 8.1.2 was immediately transferred and crushed between two flat surfaces with a hydraulic ram exerting a force of 13 kN ± 1 kN, the crushing performed in a manner that causes the most adverse result.	EL 2713-24	Separately approved cell used (See table1)	N/A
	Once maximum force has been applied, or an abrupt voltage drop of one-third of the original voltage has been obtained or 10% of deformation has occurred compared to the initial dimension, the force is released.	EL 2713-25		N/A
	A cylindrical or prismatic cell was crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus, testing wide side of prismatic cells	EL 2713-26		N/A
	c) Acceptance criteria:			N/A
	Results: no fire, no explosion.*	EL 2713-27		N/A
8.3.6	Over-charging of battery	EL 2713-28	See below	P
	a) Requirements:			P
	Charging for longer periods than specified by the manufacturer shall not cause fire or explosion*	EL 2713-29	No fire or explosion (See table 8.3.6)	P
	b) Test:			P
	The test was carried out in an ambient temperature of +20 °C ± 5 °C. Each test battery was discharged at a constant current of 0,2 It A, to a final discharge voltage	EL 2713-30	Five fully discharged batteries at 20°C ± 5°C are tested for this condition	P

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Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
	specified by the manufacturer.			
	Sample batteries were then charged at a constant current of 2,0 It A, using a supply voltage (not exceeding the maximum voltage supplied by the recommended charger – If value not available it was 5,0 V per cell) sufficient to maintain this current of 2,0 It A throughout the duration of the test or until the supply voltage is reached.	EL 2713-31	Complied	P
	A thermocouple was attached to each test battery. For battery packs, the temperature was measured on the battery pack casing.	EL 2713-32	The temperature was measured and monitored. See table 8.3.6	P
	The 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.	EL 2713-33	The test would be continued until the temperature of the outer casing returns to ambient	P
	c) Acceptance criteria:			P
	Results: no fire, no explosion.*	EL 2713-34	No fire, No explosion	P
8.3.7	Forced discharge (cells)	EL 2713-35	See below	N/A
	a) Requirements:			N/A
	A cell in a multi cell application shall withstand polarity reversal without causing fire or explosion.*	EL 2713-36		N/A
	b) Test:			N/A
	Discharged cells intended for use in multi-cell applications, were subjected to a reverse charge at 1 It A for 90 minutes.	EL 2713-37	Separately approved cell used (See table1)	N/A
	c) Acceptance criteria:			N/A
	Results: no fire, no explosion*	EL 2713-38		N/A
8.3.8	Transport tests	EL 2713-39		P
	Manufacturer's documentation provided to demonstrate compliance. IEC 62281 may be referred for transportation tests.	EL 2713-40	Manufacturer provided a document (UN 38.3 test report) for compliance	P

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Tests relating to Electrical Safety

EL 2713 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
8.3.9	Design evaluation – Forced internal short circuit (cells)	EL 2713-41	This Country specific test is not applicable in INDIA	N/A
	a) Requirements:			N/A
	Forced internal short circuit test for cylindrical cells and prismatic cells shall not cause fire. This country specific test which is only applicable to France, Japan, Korea and Switzerland and is not required on polymer cells.*	EL 2713-42		N/A
	b) Test:			N/A
	The forced internal short circuit test is performed in a chamber at +10 °C and +45 °C (ambient internal chamber temperature) according to the procedure at clause 8.3.9b).	EL 2713-43		N/A
	c) Acceptance criteria:			N/A
	Results: No fire.*	EL 2713-44		N/A

*- Total number of Requirements to be observed / inspected = 17

Total No of applicable Requirement = 07

No of Requirements for which the sample passed: 07

Total number of tests to be conducted : 28

Total No of applicable Tests = 13

No. of tests for which the sample passed: 13

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



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Tests relating to General Requirements

EL 2714 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
9	Information for Safety*	EL 2714-00	See below	P
	For secondary cells, information is provided about current, voltage and temperature limits.	EL 2714-01	Not for battery pack	N/A
	For batteries, information to minimize and mitigate hazards is provided.	EL 2714-02	Complied	P
	Information relating to hazard avoidance resulting from a system analysis is provided to the end user:*	EL 2714-03	Complied	P

*-Total number of Requirements to be observed / inspected = 02

Total No of applicable Requirement = 02

No of Requirements for which the sample passed: 02

Total number of tests to be conducted : 02

Total No of applicable Tests = 01

No. of tests for which the sample passed: 01

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


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Tests relating to Markings Requirements

EL 2715 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
10	Markings*	EL 2715-00	See below	P
10.1	Cell Marking*	EL 2715-01		N/A
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.*	EL 2715-02	Product is Li-ion Polymer Battery	N/A

*-Total number of Requirements to be observed / inspected = 03

Total No of applicable Requirement = 01

No of Requirements for which the sample passed: 01

Total number of tests to be conducted : 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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


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Tests relating to Markings Requirements

EL 2716 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
10.2	Battery Markings*	EL 2716-00	See below	P
	Batteries marked in accordance with the requirements for the cells from which they are assembled*.	EL 2716-01	Marked	P
	Batteries marked with an appropriate caution statement*.	EL 2716-02	Complied	P

*- Total number of Requirements to be observed / inspected = 03

Total No of applicable Requirement = 03

No of Requirements for which the sample passed: 03

Total number of tests to be conducted = 00

Total No of applicable Tests = 00

No. of tests for which the sample passed= N/A

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

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Tests relating to Markings Requirements

EL 2717 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
10.3	Other Information*	EL 2717-00	See below	P
	Storage and disposal instructions marked on or supplied with the battery*.	EL 2717-01	Information of safety mentioned in manufacturer specification	P
	Recommended charging instructions marked on or supplied with the battery*.	EL 2717-02	Information of safety mentioned in manufacturer specification	P

*-Total number of Requirements to be observed / inspected = 03

Total No of applicable Requirement = 03

No of Requirements for which the sample passed: 03

Total number of tests to be conducted : 00

Total No of applicable Tests = 00

No. of tests for which the sample passed: N/A

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



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Tests relating to Mechanical properties

EL 2718 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
11	Packaging*	EL 2718-00	See below	P
	The secondary cells and batteries for transport are so packed to prevent opportunities for short circuit, mechanical damage and possible ingress of moisture. 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*.	EL 2718-01	Satisfactory	P

*- Total number of Requirements to be observed / inspected = 02

Total No of applicable Requirement =02

No of Requirements for which the sample passed= 02

Total number of tests to be conducted =00

Total No of applicable Tests = 00

No. of tests for which the sample passed= N/A

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

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Tests relating to Mechanical properties

EL 2719 – V2.0

Cl. No.	Test / Requirement name	Test Code	Test result/ observation	Verdict
A	Charging range of secondary lithium ion cells for safe use	EL 2719-00	Safely Certified Battery Cell used	P
A.1	General	EL 2719-01	See below	P
A.2	Safety of lithium-ion secondary battery	EL 2719-02	4.2V applied	P
A.3	Consideration on charging voltage	EL 2719-03	See below	P
A.3.1	General	EL 2719-04	Charging voltage is not exceeded the value which is specified by the manufacturer	P
A.3.2	Upper limit charging voltage	EL 2719-05	See below	P
A.3.2.1	General	EL 2719-06	Upper limit charging voltage is 4.2V	P
A.3.2.2	Explanation of safety viewpoint	EL 2719-07	Not exceeded 4.2V	N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	EL 2719-08	Considered	P
A.4	Consideration of temperature and charging current	EL 2719-09	In compliance	P
A.4.1	General	EL 2719-10	See below	P
A.4.2	Recommended temperature range	EL 2719-11	Charge temperature declared by the manufacture 10°C~45°C	P
A.4.2.1	General	EL 2719-12	See below	P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	EL 2719-13	Test carried out at temperature range 10°C~45°C	P
A.4.3	High temperature range	EL 2719-14	See below	N/A
A.4.3.1	General	EL 2719-15	Higher temperature range not exceeded 45°C	N/A
A.4.3.2	Explanation of safety viewpoint	EL 2719-16	As above	N/A
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range	EL 2719-17	As above	N/A
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range	EL 2719-18	As above	N/A
A.4.4	Low temperature range	EL 2719-19	See below	N/A

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A.4.4.1	General	EL 2719-20	Lower temperature range not exceeded 10°C	N/A
A.4.4.2	Explanation of safety viewpoint	EL 2719-21	As above	N/A
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range	EL 2719-22	As above	N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	EL 2719-23	As above	N/A
A.4.5	Scope of the application of charging current	EL 2719-24	In compliance	P
A.5	Sample preparation	EL 2719-25	This is country specific test which is not applicable in india	N/A
A.5.1	General	EL 2719-26		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short	EL 2719-27		N/A
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew points	EL 2719-28		N/A
A.5.3	Disassembly of charged cell	EL 2719-29		N/A
A.5.4	Shape of nickel particle	EL 2719-30		N/A
A.5.5	Insertion of nickel particle to cylindrical cell	EL 2719-31		N/A
A.5.5.1	Insertion of nickel particle to winding core	EL 2719-32		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator	EL 2719-33		N/A
A.5.6	Insertion of nickel particle to prismatic cell	EL 2719-34		N/A

*- Total number of Requirements to be observed / inspected = 35

Total No of applicable Requirement = 14

No of Requirements for which the sample passed= 14

Total number of tests to be conducted = 00

Total No of applicable Tests = 00

No. of tests for which the sample passed= N/A

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

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5.1 – 5.6	Table 1: List of critical Components				P
Object/part No.	Manufacturer/ trademark	Type/Model	Technical Data	Standard	Marks of Conformity ¹⁾
Battery cell	Shenzhen Hui Jin Long Trading Co.,Ltd.	502030-250mAh	3.7V, 250mAh	IS 16046:2015/ IEC 62133:2012	BIS No. R-41074918
PCB	SHENZHEN CITY JIAWANTONGDA CIRCUIT CO LTD	JWTD-M	V-0, 130°C	UL 796 (No equivalent IEC standard available)	UL (E492187)
IC	SEIKO	S8261-G3J	Over Charge protection voltage:4.255-4.305V Over discharge protection voltage:2.32-2.48V, Over current Detection voltage:0.195~0.255V, Temperature rang:-40~85°C	IS 16046:2015/ IEC 62133:2012	Tested with equipment
MOSFET	FNK Semiconductor	8205A	ID:7A VDS:20V	IS 16046:2015/ IEC 62133:2012	Tested with equipment
Enclosure	KK ENTERPRISE CO LTD	HTLW	Polycarbonate, 80°C	UL 969 (No equivalent IEC standard available)	UL (MH13600)
Lead Wire	DONGGUAN ZHONGZHENG WIRE & CABLE TECH CO LTD	1571	50AWG Fire rating: VW-1 or FT-1 Tmax:80°C Vmax:30Vac	UL 758 (No equivalent IEC standard available)	UL (E336285)

supplementary information:

¹⁾Evidence have been evaluated and checked for the agreed level of compliance as per the referred standard.



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TABLE: 7.2.1	Continuous Low Rate Charge Test(cells)				N/A
Model	Recommended Charging Method, CC, CV, or CC/CV	Recommended Charging Voltage Vc, Vdc	Recommended Charging Current Irec, A	OCV at Start of Test, Vdc	Results
---	---	---	---	---	---
supplementary information: A – No fire, leakage or explosion B – Fire observed C – Leakage observed D – Explosion observed					

TABLE: 7.2.2	Vibration Test	N/A
Model	OCV at Start of Test, Vdc	Results
---	---	---
supplementary information: A – No fire, leakage or explosion B – Fire observed C – Leakage observed D – Explosion observed		



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TABLE: 7.3.8	Overcharge			N/A
Model	OCV prior to charging, (Vdc)	Maximum charge current, (A)	Time for charging, (hours)	Results

Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)				

TABLE: 7.3.9	Forced discharge (cells)			N/A
Model	OCV before application of reverse charge, (Vdc)	Measured reverse charge I _r , (A)	Time for reversed charge, (minutes)	Results
--	--	----	--	--
Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)				



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TABLE: 8.2.1	Continuous charging at constant voltage (cells)			N/A
Model	Recommended charging voltage V_c (Vdc)	Recommended charging current I_{rec} (A)	OCV at start of test, (Vdc)	Results

Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)				

TABLE: 8.3.1	External short circuit (cell)				N/A
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT , (°C)	Results
Samples charged at charging temperature upper limit:					

Samples charged at charging temperature lower limit:					
--					
Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)					

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TABLE: 8.3.2		External short circuit (battery)			P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature rise ΔT, (°C)	Results
Samples charged at charging temperature upper limit: 45°C					
502030	55±5°C	4.18	76	1.1	A
		4.17	76	0.8	A
		4.18	76	1.2	A
		4.19	76	0.9	A
		4.16	76	0.8	A
Samples charged at charging temperature lower limit: 10°C					
502030	55±5°C	4.17	76	0.8	A
		4.18	76	1.1	A
		4.19	76	0.9	A
		4.19	76	0.9	A
		4.18	76	1.0	A
Supplementary information:					
-A: No fire or explosion					
-B: No leakage					
-C: Leakage					
-D: Fire					
-E: Explosion					
-F: Bulge					
-G: Others (please explain)					



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TABLE: 8.3.5	Crush(cells)				N/A
Model	OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Width/ diameter of cell before crush, (mm)	Required deformation for crush, (mm)	Results
Samples charged at charging temperature upper limit					

Samples charged at charging temperature lower limit					

Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)					



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TABLE: 8.3.6		Over-charging of battery	P
Constant charging current (A).....:		0.5A	—
Supply voltage (Vdc).....:		5.0Vdc	—
Model	OCV before charging, (Vdc)	Maximum outer casing temperature, (°C)	Results
502030	3.01	19.7	A
	3.06	20.8	A
	3.03	18.9	A
	3.05	21.5	A
	3.04	22.3	A
Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge			



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TABLE: 8.3.7	Forced discharge (cells)			N/A
Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_r , (A)	Time for reversed charge, (minutes)	Results
---	---	---	---	---
Supplementary information: - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)				

TABLE: 8.3.9	Forced internal short circuit (cells)				N/A
Model	Chamber ambient, (°C)	OCV at start of test, (Vdc)	Particle location ¹⁾	Maximum applied pressure, (N)	Results

Supplementary information: ¹⁾ Identify one of the following: 1: Nickel particle inserted between positive and negative (active material) coated area. 2: Nickel particle inserted between positive aluminum foil and negative active material coated area. - A: No fire or explosion - B: No leakage - C: Leakage - D: Fire - E: Explosion - F: Bulge - G: Others (please explain)					

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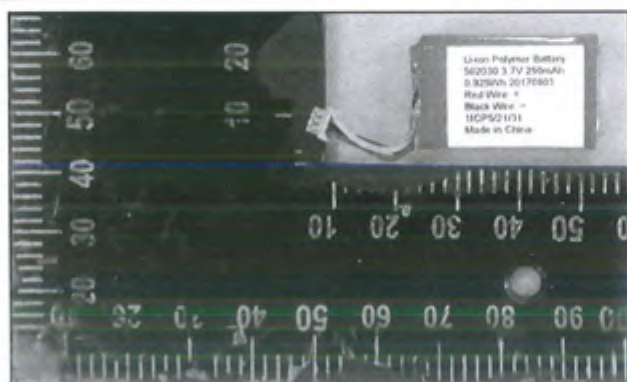
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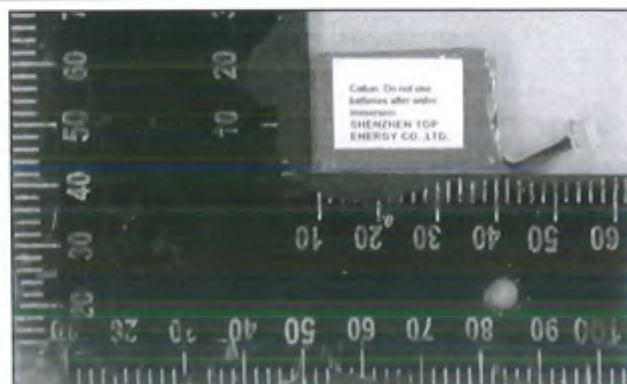
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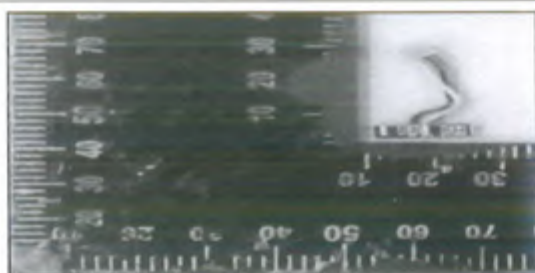
PHOTOGRAPH



Front- View



Back View



PCB Front View



PCB Rear View



Cell-View

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