	Test Report issued under the responsibility of: **NCB TÜV SÜD PSB Pte Ltd.** **15 International Business Park, TÜV SÜD@IBP** **Singapore 609937** **Singapore**	

TEST REPORT
IEC 62619
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications

Report Number. ..... :	085-282360614-000
Date of issue ..... :	2024-03-26
Total number of pages ..... :	21 pages
Name of Testing Laboratory preparing the Report ..... :	TÜV SÜD New Energy Testing (Guangdong) Co., Ltd.
Applicant's name ..... :	Hefei Gotion High-tech Power Energy Co., Ltd.
Address ..... :	No.599, Daihe Road, Xinzhan District, 230012 Hefei City, Anhui Province, PEOPLE'S REPUBLIC OF CHINA
Test specification:	
Standard ..... :	IEC 62619:2022
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
TRF template used ..... :	IECEE OD-2020-F1:2022, Ed.1.5
Test Report Form No. ..... :	IEC62619B
Test Report Form(s) Originator .... :	UL Solutions (Demko)
Master TRF ..... :	Dated 2023-02-24

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.
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Test item description ..... :	Lithium-Ion Rechargeable Cell
Trademark(s) ..... :	N/A
Manufacturer ..... :	Tongcheng Gotion New Energy Co., Ltd. No.1, Longchi Road, Tongcheng Economic and Technological Development District, 231400 Anqing City, Anhui Province, PEOPLE'S REPUBLIC OF CHINA
Model/Type reference ..... :	IFR32135 -15Ah
Ratings ..... :	3.2Vd.c., 15Ah

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**	TÜV SÜD New Energy Testing (Guangdong) Co., Ltd.	
Testing location/ address.....:		North-1/F, 2/F & Unit 301-3/F, TÜV SÜD Testing Center, D1, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China	
Tested by (name, function, signature).....:		Jenn Sun (Project Handler)	Jenn Sun
Approved by (name, function, signature)...:		Zoey Liu (Designated Reviewer)	
☐	**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):

Attachment No. 1: Photo Documentation (2 pages)

Summary of testing:

Tests performed (name of test, test clause and date test performed):

In section 7, each test clause below is performed with three cells except for clause 7.3.2 with five cells.

Name of test, test clause	Date of test performed
- Cl. 7.2.1 External short-circuit test (cell or cell block)	2023-12-21
- Cl. 7.2.2 Impact test (cell or cell block)	2023-12-21
- Cl. 7.2.3.2 Whole drop test (cell or cell block, and battery system)	2023-12-25
- Cl. 7.2.4 Thermal abuse test (cell or cell block)	2023-12-21 to 2023-12-22
- Cl. 7.2.5 Overcharge test (cell or cell block)	2023-12-14 to 2023-12-15
- Cl. 7.2.6 Forced discharge test (cell or cell block)	2023-12-14
- Cl. 7.3.2 Internal short-circuit test (cell)	2023-12-22 to 2023-12-25

The samples comply with the above requirements of IEC 62619:2022 (Edition 2.0).

Testing location: (CBTL, SPTL, CTF, Subcontractor)

TÜV SÜD New Energy Testing (Guangdong) Co., Ltd.

Address: North-1/F, 2/F & Unit 301-3/F, TÜV SÜD Testing Center, D1, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China

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

N/A

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:

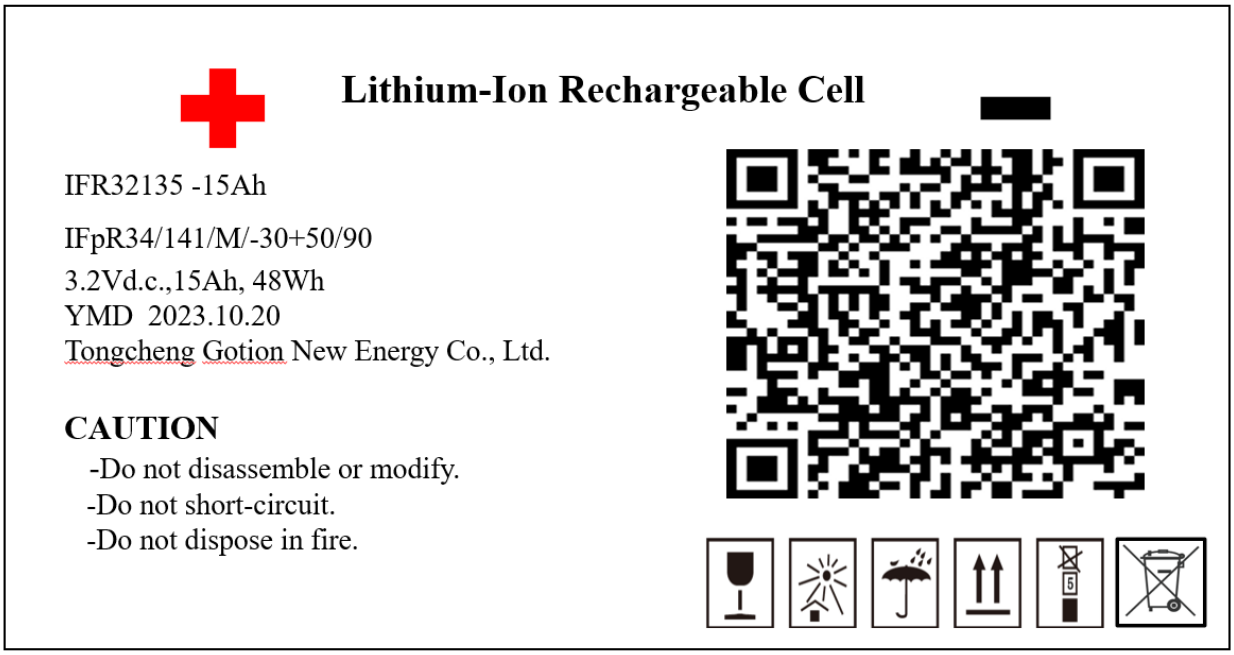
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

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.



Remark:

1.“2023.10.20” represents the date of manufacture. It is just an example and not for actual sample.

2. There is QR code on the cell, which can trace the detail information of the cell.

Test item particulars.....:	Lithium-Ion Rechargeable Cell
Classification of installation and use.....:	Use in industrial applications
Supply Connection.....:	Supply by terminals
.....:	
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 .....:	2023-11-16
Date (s) of performance of tests.....:	2023-12-08 to 2024-03-25

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** ☒ **Not applicable**

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

Name and address of factory (ies).....:	Tongcheng Gotion New Energy Co., Ltd. No.1, Longchi Road, Tongcheng Economic and Technological Development District, 231400 Anqing City, Anhui Province, PEOPLE'S REPUBLIC OF CHINA

General product information and other remarks:

The Lithium-Ion Rechargeable Cell, model No. IFR32135-15Ah is used in industrial applications.

Additionally, detail information of the cell is shown in the following table:

Product name	Lithium-Ion Rechargeable Cell
Type/model	IFR32135-15Ah
Nominal voltage	3.2Vd.c.
Rated capacity	15Ah
Charging voltage declared by manufacturer	3.65V
Upper limit charging voltage	3.8V
Charging current declared by manufacturer	3A
Maximum continuous charging current	18A
Discharging current declared by manufacturer	5A
Maximum continuous discharging current	22.5A
Discharging cut off voltage	2.0V
Lower limit discharging voltage	1.8V
Standard temperature range for charging	-20°C to 55°C
Standard temperature range for discharging	-30°C to 60°C
Standard charging method by manufacturer	Charging the cell with 3A constant current until to 3.65V, then constant voltage 3.65V until charging current reduces to 0.75A
Charging method for internal short-circuit test	Charging the cell with constant current 18A until 3.8V, then constant voltage 3.8V until charging current reduces to 0.75A (0.05ItA)
Dimension	Diameter: (33.6+0/-0.4)mm, Height: (139.7±0.5)mm
Weight	(268±5)g

The final evaluation of the cell must be conducted in the end device application for which the cell will be used.

IEC 62619			
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 are safe under conditions of both intended use and reasonably foreseeable misuse... :	Clause 6, Clause 7, 8.1, and 8.2. See also table 5.1 for Critical components information	P
	Reduce the risk of injuries from moving parts		N/A
5.2	**Insulation and wiring**		P
	Voltage, current, altitude, and humidity requirements		P
	Adequate clearances and creepage distances between connectors and live parts at different voltages or between live parts and non-current-carrying accessible parts		N/A
	Protect from hazardous live parts, including during installation		N/A
	The mechanical integrity of internal connections		P
5.3	**Venting**		P
	Pressure relief function		P
	Encapsulation used to support cells within an outer casing		N/A
5.4	**Temperature/voltage/current management**		N/A
	The design prevents abnormal temperature-rise		N/A
	Voltage, current, and temperature limits of the cells		N/A
	Specifications and charging instructions for equipment manufacturers		N/A
5.5	**Terminal contacts of the battery pack and/or battery system**		N/A
	Polarity marking(s)		N/A
	Polarity marking not provided for keyed external connector		N/A
	Capability to carry the maximum anticipated current		N/A
	External terminal contact surfaces		N/A
	Terminal contacts are arranged to minimize the risk of short circuits		N/A
5.6	**Assembly of cells, modules, or battery packs into battery systems**		N/A
5.6.1	General		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Independent control and protection method(s)		N/A
	Recommendations of cell operating limits, mounting advice, storage conditions and other design recommendations by the cell manufacturer		N/A
	Batteries designed for the selective discharge of a portion of their series connected cells		N/A
	Protective circuit component(s) and consideration to the end-device application		N/A
5.6.2	Battery system design		N/A
	The voltage control function		N/A
	Maximum charging/discharging current of the cell are not exceeded		N/A
5.7	**Operating region of lithium cells and battery systems for safe use**		P
	The cell operating region..... :	See page 7	P
	Designation of battery system to comply with the cell operating region		N/A
5.8	**System lock (or system lock function)**		N/A
	Non-resettable function to stop battery operation		N/A
	Manual with procedure for resetting of battery operation		N/A
	Emergency battery final discharge		N/A
5.9	**Quality plan**		P
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented..... :	Reference: ISO 9001 certificate was provided	P
	The process capabilities and the process controls		P
6	**TYPE TEST CONDITIONS**		P
6.1	**General**		P
6.2	**Test items**		P
	Cells or batteries that are not more than six months old (See Table 1 of IEC 62619)		P
	Capacity confirmation of the cells or batteries		P
	Default ambient temperature of test, 25 °C ± 5 °C		P
7	**SPECIFIC REQUIREMENTS AND TESTS**		P
7.1	**Charging procedure for test purposes**		P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	The battery discharged to a specified final voltage prior to charging		P
	The cells or batteries charged using the method specified by the manufacturer ..... :	See page 7	P
7.2	**Reasonably foreseeable misuse**		P
7.2.1	External short-circuit test (cell or cell block)		P
	Short circuit with total resistance of 30 mΩ ± 10 mΩ at 25 °C ± 5 °C		P
	Results: no fire, no explosion	See Table 7.2.1.	P
7.2.2	Impact test (cell or cell block)		P
	Cylindrical cell, longitudinal axis impact		P
	Prismatic cell, longitudinal axis and lateral axis impact		N/A
	Results: no fire, no explosion.		P
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		P
7.2.3.2	Whole drop test (cell or cell block, and battery system)		P
	Description of the Test Unit ..... :	Cell	—
	Mass of the test unit (kg) ..... :	Measured: Max. 277.4g (with terminals) Max. 272.0g (without terminals)	—
	Height of drop (m) ..... :	1.00m	—
	Results: no fire, no explosion		P
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)		N/A
	Description of the Test Unit ..... :		—
	Mass of the test unit (kg) ..... :		—
	Height of drop (m) ..... :		—
	Results: no fire, no explosion		N/A
7.2.4	Thermal abuse test (cell or cell block)		P
	Results: no fire, no explosion		P
7.2.5	Overcharge test (cell or cell block)		P
	For those battery systems that are provided with only a single protection for the charging voltage control		—
	Results: no fire, no explosion ..... :	See Table 7.2.5.	P
7.2.6	Forced discharge test (cell or cell block)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Cells connected in series in the battery system ..... :		N/A
	Redundant or single protection for discharge voltage control provided in battery system ..... :		N/A
	Target Voltage ..... :	-3.8V	P
	Maximum discharge current of the cell, Im..... :	22.5A	P
	Discharge current for forced discharge, 1.0 It ..... :	15A	P
	Discharging time, t = (1 It / Im) x 90 (min.) ..... :	90min	P
	Results: no fire, no explosion ..... :	See Table 7.2.6.	P
7.3	**Considerations for internal short-circuit – Design evaluation**		P
7.3.1	General		P
7.3.2	Internal short-circuit test (cell)		P
	Samples preparation procedure: In accordance with Clause A.5 and A.6 of IEC 62133-2:2017		P
	Tested per 7.3.2 b) in an ambient temperature of 25 °C ± 5 °C.		P
	The appearance of the short-circuit location recorded by photograph or other means .....:	By photograph	—
	The pressing was stopped - When a voltage drop of 50 mV was detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) was reached	800N	P
	Results: no fire ..... :	See Table 7.3.2.	P
7.3.3	Propagation test (battery system)		N/A
	Method to create a thermal runaway in one cell ... :	See Annex B and C	N/A
	Results: No external fire from the battery system, no battery case rupture ..... :	See results in Table 7.3.3	N/A
8	**BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)**		N/A
8.1	**General requirements**		N/A
	Functional safety analysis for critical controls		N/A
	Conduct of a process hazard analysis for both the cell manufacturing process and the battery system manufacturing process		N/A
	Conduct of risk assessment and mitigation of the battery system		N/A
8.2	**Battery management system (or battery management unit)**		N/A
8.2.1	Requirements for the BMS		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The safety integrity level (SIL) target of the BMS		N/A
	The charge control evaluated by tests in clauses 8.2.2 to 8.2.4		N/A
8.2.2	Overcharge control of voltage (battery system)		N/A
	The exceeded charging voltage applied to the whole battery system		N/A
	The exceeded charging voltage applied to only a part of the battery system, such as the cell(s) ..... :		N/A
	Results: no fire, no explosion ..... :	See Table 8.2.2.	N/A
	The BMS terminated the charging before exceeding the upper limit charging voltage		N/A
8.2.3	Overcharge control of current (battery system)		N/A
	Results: no fire, no explosion ..... :	See Table 8.2.3	N/A
	The BMS detected the overcharging current and controlled the charging to a level below the maximum charging current		N/A
8.2.4	Overheating control (battery system)		N/A
	The cooling system, if provided, was disconnected		N/A
	Elevated temperature for charging, 5 °C above maximum operating temperature ..... :		N/A
	Results: no fire, no explosion ..... :	See Table 9.2.5	N/A
	The BMS detected the overheat temperature and terminated charging		N/A
	The battery system operated as designed during test		N/A

9	**EMC**		N/A
	Battery system fulfil EMC requirements of the end-device application ..... :	See Table 9 [ ] See attachment # __ for detail EMC report [√] Intended for to be tested in the end use application [*include specific application*]	N/A

10	**INFORMATION FOR SAFETY**		P
	The cell manufacturer provides information about current, voltage and temperature limits of their products		P
	The battery system manufacturer provides information regarding how to mitigate hazards to equipment manufacturers or end-users.		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
11	**MARKING AND DESIGNATION (REFER TO CLAUSE 5 OF IEC 62620)**		P
	The marking items shown in Table 1 in IEC 62620 indicated on the cell, battery system or instruction manual.		P
	Cell or battery system has clear and durable markings		P
	Cell designation		P
	Battery designation		N/A
	Battery structure formulation		N/A
12	**PACKAGING AND TRANSPORT**		P
	Refer to Annex D		P
ANNEX A	**OPERATING REGION OF CELLS FOR SAFE USE**		P
A.1	General		P
A.2	Charging conditions for safe use		P
A.3	Consideration on charging voltage		P
A.4	Consideration on temperature		P
A.5	High temperature range		N/A
A.6	Low temperature range		N/A
A.7	Discharging conditions for safe use		P
A.8	Example of operating region		P
ANNEX B	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY LASER IRRADIATION**		N/A
B.1	**General**		N/A
B.2	**Test conditions**		N/A
B.2.1	Cell test (preliminary test)		N/A
	The cell fully charged according to the manufacturer recommended conditions ..... :		—
	Laser irradiation point on the cell ..... :		—
	Output power of laser irradiation..... :		—
	Tested in an ambient temperature of 25 °C ± 5 °C		N/A
	Repeat of cell test for 3 times		N/A
B.2.2	Battery system test (main test)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The battery system fully charged according to the manufacturer recommended conditions ..... :		—
	Target cell to be laser irradiated ..... :		—
	The irradiation point on the target cell same or similar as that on the cell test		
	Output power of laser irradiation..... :		—
	Tested in an ambient temperature of 25 °C ± 5 °C		

ANNEX C	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY METHODS OTHER THAN LASER**		N/A
C.1	General		N/A
C.2	Test conditions:		N/A
	– The battery fully charged according to the manufacturer recommended conditions ..... :		—
	– Target cell forced into thermal runaway ..... :		—
	– A specially prepared sample (e.g. a heater or a hole for nail penetration provided) used for ease of testing..... :		—
C.3	Method used for initiating the thermal runaway. 1) Heater (Heater, Burner, Laser, Inductive heating 2) Overcharge 3) Nail penetration of the cell 4) Combination of above methods 5) Other methods..... :		—

ANNEX D	**PACKAGING AND TRANSPORT**		P
	The materials and pack design chosen in a way as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		P
	Regulations concerning international transport of secondary lithium batteries		P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

5.1	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
1.Cell	Tongcheng Gotion New Energy Co., Ltd.	IFR 32135-15Ah	3.2Vd.c., 15Ah	IEC 62619:2022	-
- Electrolyte	Jiujiang Tianci High-Tech Materials Co., Ltd.	GX-CV-01	$LiPF_6$, EC, EMC, VC	-	-
- Separator	Hefei Senior New Energy Materials Co., Ltd	9+2μm	PE, 5120mm × 124.5mm × 11μm	-	-
- Positive electrode	Tongcheng Gotion New Energy Co., Ltd.	CL176	$LiFePO_4$, Conductive Additive PVDF, Aluminium Foil, 2330mm × 119mm × 178μm	-	-
- Negative electrode	Tongcheng Gotion New Energy Co., Ltd.	FC -12G	Carbon, Conductive Additive PVDF, Copper Foil, 2400mm × 121.5mm × 120μm	-	-
- Positive electrode tab	Hefei Precision coating Co., LTD	13μm	Aluminium Foil, 3.5mm × 13μm	-	-
- Negative electrode tab	Jiujiang Defu Technology Co., LTD	4.5μm	Copper Foil, 3mm × 4.65μm	-	-
- Insulation tap	Hui new material Technology Co., LTD	18mm*45μm	PET, 18mm × 45μm	-	-
-Can	Hefei Lixiang Battery Technology Co., Ltd.	3003	0.38mm, Aluminium	-	-
- Top Case / Venting	Hefei Lixiang Battery Technology Co., Ltd.	1060	0.3mm, Aluminium, 1.8~2.4MPa	-	-

Supplementary information:

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

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: External short-circuit test (cell or cell block)				P
Sample No.	**Ambient (at 25°C ± 5°C)**	**OCV at start of test (V dc)**	**Resistance of Circuit (mΩ)**	**Maximum Case Temperature Rise ΔT (°C K)**	**Results**
Cell 1	24.7	3.333	33.0	65.2	A, E
Cell 2	24.7	3.335	33.7	50.9	A, E
Cell 3	24.7	3.334	35.4	52.2	A, E

Supplementary information:

A – No fire or Explosion
B – Fire
C – Explosion
D – The test was completed after 6 h
E – The test was completed after the cell casing cooled to 20% of the maximum temperature rise
F – Other (Please explain):___

7.2.5	TABLE: Overcharge test (cell or cell block)					P
Sample No.	**OCV at start of test (V dc)**	**OCV at end of test (V dc)**	**Measured Maximum Charging Current (A)**	**Measured Maximum Charging Voltage (V dc)**	**Max. Cell Case Temperature, (°C)**	**Results**
Cell 13	2.587	3.401	18	4.560	41.7	A, E
Cell 14	2.568	3.380	18	4.560	41.0	A, E
Cell 15	2.589	3.387	18	4.560	40.1	A, E

Supplementary information:

Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Test concluded when temperature reached a steady state condition
E – Test concluded when temperature returned to ambient
F – Other (Please explain): _____

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.6	TABLE: Forced discharge test (cell or cell block)				P
Sample No.	**OCV before applying reverse charge, (V dc)**	**Target Voltage (V dc)**	**Measured Reverse Charge Current It, (A)**	**Total Time for Reversed Charge Application (min)**	**Results**
Cell 16	2.587	-3.80	15	90	A
Cell 17	2.621	-3.80	15	90	A
Cell 18	2.607	-3.80	15	90	A

Supplementary information:

Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Other (Please explain): ___

7.3.2	TABLE: Internal short-circuit test (cell)			P
Sample No.	**OCV at start of test, (V dc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Results**
Cell 19	3.333	1	800	A, E
Cell 20	3.331	1	800	A, E
Cell 21	3.332	1	800	A, E
Cell 22	3.332	1	800	A, E
Cell 23	3.332	1	800	A, E

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.

Results:

A – No fire or explosion
B – Fire
C – Explosion
D – Test concluded when 50 mV voltage drop occurred prior to reaching force limit
E – Test concluded when 800/400 N pressure was reached and 50 mV voltage drop was not achieved
F – Test was concluded when fire or explosion occurred
G – Other (Please explain): __

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

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.3	TABLE: Propagation test (battery system)				N/A
Sample No.	**OCV of Battery System Before Test, (V dc)**	**OCV of Target Cell Before Test, (V dc)**	**Maximum Cell Case Temperature, (°C)**	**Maximum DUT Enclosure Temperature, (°C)**	**Results**
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Method of cell failure [1)]	Location of target cell	Area for fire protection (m^2)
-	-	-
-	-	-
-	-	-

Supplementary information:

1) Cell can be failed through laser exposure, applied heat, overcharge, nail penetration or combinations of these failures or other acceptable methods. See supporting documentation for details on cell failure method

2) If the battery system has no outer covering, the manufacturer is required to specify the area for fire protection.

Results:
A – No fire external to DUT enclosure or area for fire protection or no battery case rupture
B – Fire external to DUT enclosure or area for fire protection
C – Explosion
D – Battery case rupture
E – Other (Please explain): __

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.2	TABLE: Overcharge control of voltage (battery system)				N/A
Sample No.	**OCV at start of test for Cell/Cell Blocks, (V dc)**	**Maximum Charging Current, (A)**	**Max. Charging Voltage, (V dc)**	**Max. Voltage of Cell/Cell Blocks, (V dc)**	**Results**
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

	Charge Voltage Applied Battery System: 1)	
	Whole	**Part**
	-	-

Supplementary information:

1) The exceeded voltage can be applied to only a part of the system such as the cell(s) in the battery system per Figure 6 of IEC 62619, if it is difficult to do it in using the whole battery system.

Results:
A – No Fire or Explosion
B – Fire
C – Explosion
D – The voltage of the measured cells or cell blocks did not exceed the upper limit charging voltage
E – The voltage of the measured cells or cell blocks did exceed the upper limit charging voltage
F – All function of battery system did operate as intended during the test.
G – All function of battery system did not operate as intended during the test.
H – Other (Please explain): ___

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.3	TABLE: Overcharge control of current (battery system)			N/A
Sample No.	**OCV at start of test, (V dc)**	**Max. Charging Current, (A)**	**Max. Charging Voltage, (V dc)**	**Results**
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Supplementary information:

Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Overcurrent sensing function of BMU did operate and then charging stopped
E – Overcurrent sensing function of BMU did not operate and then charging stopped
F – All function of battery system did operate as intended during the test.
G – All function of battery system did not operate as intended during the test.
H – Other (Please explain): ____

8.2.4	TABLE: Overheating control (battery system)		N/A
Model No.	**OCV at start (SOC 50%) of test, V dc**	**Maximum Charging Current, A**	Measured **Maximum Charging Voltage, V dc**
-	-	-	-
-	-	-	-
-	-	-	-
Maximum Specified Temperature of Battery System, °C		**Maximum Measured Cell Case Temperature, °C**	**Results**
-		-	-
-		-	-
-		-	-

Supplementary information:

Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Temperature sensing function of BMU did operate and then charging stopped
E – Temperature sensing function of BMU did not operate and then charging stopped
F – All function of battery system did operate as intended during the test.
G – All function of battery system did not operate as intended during the test.
H – Other (Please explain): ____

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

9	**TABLE: EMC**				**N/A**
Standard used for EMC test:			N/A		
Sample No.	**EMC Test Item**	**Battery Condition**	**EMC Test Level/ Parameters**	**Compliance Criteria**	**Results**
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Supplementary information:

Battery Condition During EMC test

1 – In Operation Mode, [ ] Supplied at ____, [ ] Load at____

2 – In non-operation Mode, Battery state of charge (SOC) before test at around____

Compliance Criteria and Test Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Battery system did operate as intended during the test.
E - All function of battery system did operate as intended after the test.
F - All function of battery system did not operate as intended during the test, (Please explain): ____
G - Other (Please explain): ____

--- End ---