


<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>CN24QN64 001</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	244511139	Seite 1 von 23 Page 1 of 23
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>		<b>Auftragsdatum:</b> <i>Order date:</i>	2024-01-18	
<b>Auftraggeber:</b> <i>Client:</i>	Australia National Power Storage Holding Pty Ltd. Chatswood West, NsW 2067, Australia			
<b>Prüfgegenstand:</b> <i>Test item:</i>	Iron Phosphate-Lithium Cell			
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	3777AH			
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	TÜV mark approval			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	EN IEC 62619:2022			
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2024-06-18			
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	Engineering sample			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2024-06-19 to 2024-07-11			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	See page 4 for details.			
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	TUV Rheinland (Shanghai) Co., Ltd			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass			
<b>geprüft von:</b> tested by: Roger Fang	<b>genehmigt von:</b> authorized by: Wilson Zhou			
<b>Datum:</b> Date: 2024-08-01	<b>Ausstellungsdatum:</b> Issue date: 2024-08-01			
<b>Stellung / Position:</b>	Sachverständige(r)/Expert	<b>Stellung / Position:</b>	Sachverständige(r)/Expert	
<b>Sonstiges /</b> <i>Other:</i>	This report is issued in TÜV mark approval.			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Test report no.:

**Anmerkungen**  
Remarks

1	<p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfbedingungen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>
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3	<p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>
4	<p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p>

Test Report issued under the responsibility of:



**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**..... : **CN24QN64 001**

**Date of issue** ..... : See cover page

**Total number of pages** ..... : See cover page

**Name of Testing Laboratory preparing the Report** ..... : TÜV Rheinland (Shanghai) Co., Ltd.

**Applicant's name** ..... : **Australia National Power Storage Holding Pty Ltd.**

**Address** ..... : Chatswood West, NsW 2067, Australia

**Test specification:**

**Standard** ..... : IEC 62619:2022

**Test procedure**..... : TÜV mark approval

**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

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**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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<b>Test item description</b> ..... :	Rechargeable Lithium-ion Cell	
<b>Trademark(s)</b> .....		
<b>Manufacturer</b> .....	Same as applicant	
<b>Model/Type reference</b> .....	3777AH	
<b>Ratings</b> .....	3.2V, 3777Ah	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input type="checkbox"/>	<b>CB Testing Laboratory:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Approved by (name, function, signature)</b> ... :		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Approved by (name, function, signature)</b> ... :		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature)</b> ... :		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature)</b> ... :		
<b>Supervised by (name, function, signature) :</b>		

<b>List of Attachments (including a total number of pages in each attachment):</b>	
Attachment 1: Photo documentation (3 pages)	
<b>Summary of testing:</b>	
<b>Tests performed (name of test, test clause and date test performed):</b> cl.7.2.1 External short circuit test (cell, 2024-06-21); cl.7.2.2 Impact test (cell, 2024-06-21); cl.7.2.3.2 Whole drop test (cell, 2024-06-20); cl.7.2.4 Thermal abuse (cell, 2024-06-21); cl.7.2.5 Overcharging (cell, 2024-07-11); cl.7.2.6 Forced discharge (cell, 2024-07-02); cl.7.3.2 Internal short-circuit test (cell, 2024-06-19);  The samples comply with the requirement of IEC 62619: 2022.	<b>Testing location: (CBTL, SPTL, CTF, Subcontractor)</b>  <b>TÜV Rheinland (Shanghai) Co., Ltd.</b> No. 177, Lane 777, West Guangzhong Road, Jing'an District, Shanghai 200072, P. R. China
<b>Summary of compliance with National Differences (List of countries addressed):</b>	
No EU Group differences.	
<input checked="" type="checkbox"/> <b>The product fulfils the requirements of EN IEC 62619:2022 (insert standard number and Year of publication, and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)</b>	

**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.

**Iron Phosphate-Lithium Cell**

Australia National Power Storage Holding Pty Ltd.  
Chatswood West, Willoughby, New South Wales 2067, Australia

Model: 3777AH

LFP2032941096/3777Ah

Rated capacity: 3777Ah      Nominal voltage: 3.2V

IFpP204/295/1097/M/-30+60/95

Date of manufacture: 2024-07-29



Secondary  
Li-ion Battery

Max charge voltage: 3.65V

Recommend charge instructions: Charging the cell with 0.5C (1888.5A) constant current and 3.65V constant voltage until the current reduces to 0.05C at ambient  $25 \pm 2^\circ\text{C}$

**CAUTION**

Don't disassemble, bump, crush or throw into fire.

In case of severe swelling, don't continue to use.

Don't expose to high temperature.

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<b>Test item particulars</b> .....:	
<b>Classification of installation and use</b> .....: To be defined in battery system.	
<b>Supply Connection</b> .....: N/A	
.....:	
<b>Possible test case verdicts:</b>	
- 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)	
<b>Testing</b> .....:	
<b>Date of receipt of test item</b> .....: 2024-06-18	
<b>Date (s) of performance of tests</b> .....: 2024-06-19 to 2024-07-11	
<b>General remarks:</b>	
"(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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC62619B:</b>	
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 .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> ..... : <b>Shaanxi Baobao Energy Storage Technology Co., Ltd</b> No. 2, Xitong Road, Xinfeng Street, Lintong District, Xi'an City, Shanxi Province, P.R.China	



**General product information and other remarks:**

The main features of the cell are shown as below:

Product name	Rechargeable Lithium-ion Cell
Model	3777AH
Cell Capacity [Ah]	3777Ah
Nominal voltage [V]	3.2
Upper limit charging voltage [V]	3.65
Recommend charging current [A]	1888.5A
Maximum charging current [A]	3777A
Recommend discharging current [A]	1888.5A
Maximum discharging current [A]	3777A
Discharge cut-off voltage [V]	2.5
Temperature range for charging [°C]	0~60°C
Temperature range for discharging [°C]	-30~60°C
Recommended charging method declared by the manufacturer	Charge at constant current 1888A until the voltage reaches 3.65V.
Weight [kg]	107±0.5kg
External dimensions (mm)	T*W*H(mm): 1095±2*294±1*203±1
Cell designation	IFpP204/295/1097/M/-30+60/95

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>PARAMETER MEASUREMENT TOLERANCES</b>		<b>P</b>
	Parameter measurement tolerances		P
<b>5</b>	<b>GENERAL SAFETY CONSIDERATIONS</b>		<b>P</b>
<b>5.1</b>	<b>General</b>		<b>P</b>
	Cells and batteries are safe under conditions of both intended use and reasonably foreseeable misuse... :	Clause 6 and Clause 7 for cell. See also table 5.1 for Critical components information.	P
	Reduce the risk of injuries from moving parts	No such components.	N/A
<b>5.2</b>	<b>Insulation and wiring</b>		<b>N/A</b>
	Voltage, current, altitude, and humidity requirements	Cell evaluated only.	N/A
	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		N/A
<b>5.3</b>	<b>Venting</b>		<b>P</b>
	Pressure relief function	Designed in cell.	P
	Encapsulation used to support cells within an outer casing		N/A
<b>5.4</b>	<b>Temperature/voltage/current management</b>		<b>N/A</b>
	The design prevents abnormal temperature-rise	Cell evaluated only.	N/A
	Voltage, current, and temperature limits of the cells		N/A
	Specifications and charging instructions for equipment manufacturers		N/A
<b>5.5</b>	<b>Terminal contacts of the battery pack and/or battery system</b>		<b>N/A</b>
	Polarity marking(s)	Cell evaluated only.	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
<b>5.6</b>	<b>Assembly of cells, modules, or battery packs into battery systems</b>		<b>N/A</b>
5.6.1	General	Cell evaluated only.	N/A
	Independent control and protection method(s)		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	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
<b>5.7</b>	<b>Operating region of lithium cells and battery systems for safe use</b>		<b>P</b>
	The cell operating region..... :		P
	Designation of battery system to comply with the cell operating region		N/A
<b>5.8</b>	<b>System lock (or system lock function)</b>		
	Non-resettable function to stop battery operation	Cell evaluated only.	N/A
	Manual with procedure for resetting of battery operation		N/A
	Emergency battery final discharge		N/A
<b>5.9</b>	<b>Quality plan</b>		<b>P</b>
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented..... :	Reference: ISO 9001: 2015 certificate provided.	P
	The process capabilities and the process controls		P

<b>6</b>	<b>TYPE TEST CONDITIONS</b>		<b>P</b>
<b>6.1</b>	<b>General</b>		<b>P</b>
<b>6.2</b>	<b>Test items</b>		<b>P</b>
	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	Tests were carried out in an ambient temperature of 25 ± 5°C.	P

<b>7</b>	<b>SPECIFIC REQUIREMENTS AND TESTS</b>		
<b>7.1</b>	<b>Charging procedure for test purposes</b>		<b>P</b>
	The battery discharged to a specified final voltage prior to charging	The cell discharged to specified final voltage 2.5V.	P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells or batteries charged using the method specified by the manufacturer..... :		P
<b>7.2</b>	<b>Reasonably foreseeable misuse</b>		<b>P</b>
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		P
7.2.2	Impact test (cell or cell block)		P
	Cylindrical cell, longitudinal axis impact		N/A
	Prismatic cell, longitudinal axis and lateral axis impact	Prismatic cell.	P
	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)	The mass of cell is more than 20kg.	N/A
	Description of the Test Unit..... :		—
	Mass of the test unit (kg)..... :		—
	Height of drop (m)..... :		—
	Results: no fire, no explosion		N/A
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)		P
	Description of the Test Unit..... :	Prismatic cell.	—
	Mass of the test unit (kg)..... :	107	—
	Height of drop (m)..... :	0.025	—
	Results: no fire, no explosion		P
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
	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..... :	-3.65V applied	P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Maximum discharge current of the cell, $I_m$ ..... :	3777A	P
	Discharge current for forced discharge, 1.0 It ..... :	3777A	P
	Discharging time, $t = (1 It / I_m) \times 90$ (min.) ..... :	90min	P
	Results: no fire, no explosion..... :	See Table 7.2.6.	P
<b>7.3</b>	<b>Considerations for internal short-circuit – Design evaluation</b>		
7.3.1	General		
7.3.2	Internal short-circuit test (cell)		
	Samples preparation procedure: In accordance with Clause A.5 and A.6 of IEC 62133-2:2017	Discharge at constant current 755.4A until the voltage reaches 2.5V. Charging at constant current 3777A until the voltage reaches 3.65V, then charging at constant voltage 3.65V at 188.85A.	
	Tested per 7.3.2 b) in an ambient temperature of $25\text{ °C} \pm 5\text{ °C}$ .		P
	The appearance of the short-circuit location recorded by photograph or other means .....	See Attachment 1: Photo documentation.	—
	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	400N	P
	Results: no fire..... :	See Table 7.3.2.	P
7.3.3	Propagation test (battery system)	Alternate test item 7.3.2 performed.	N/A
	Method to create a thermal runaway in one cell ... :		N/A
	Results: No external fire from the battery system, no battery case rupture .....		N/A

<b>8</b>	<b>BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)</b>		N/A
<b>8.1</b>	<b>General requirements</b>	<b>Cell evaluated only.</b>	<b>N/A</b>
	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
<b>8.2</b>	<b>Battery management system (or battery management unit)</b>		<b>N/A</b>
8.2.1	Requirements for the BMS		N/A

IEC 62619			
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..... :		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..... :		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..... :		N/A
	The BMS detected the overheat temperature and terminated charging		N/A
	The battery system operated as designed during test		N/A

<b>9</b>	<b>EMC</b>		N/A
	Battery system fulfil EMC requirements of the end-device application..... :	Cell evaluated only.	N/A

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

<b>11</b>	<b>MARKING AND DESIGNATION (REFER TO CLAUSE 5 OF IEC 62620)</b>		P
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IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	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	See copy of marking	P
	Battery designation		N/A
	Battery structure formulation		N/A

<b>12</b>	<b>PACKAGING AND TRANSPORT</b>		N/A
	Refer to Annex D	Informative.	N/A

<b>ANNEX A</b>	<b>OPERATING REGION OF CELLS FOR SAFE USE</b>		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	Charging upper temperature limit 60°C	P
A.6	Low temperature range	Charging lower temperature limit 0°C	P
A.7	Discharging conditions for safe use	-20 °C to 60°C	P
A.8	Example of operating region		P

<b>ANNEX B</b>	<b>PROCEDURE OF 7.3.3 PROPAGATION TEST BY LASER IRRADIATION</b>		N/A
<b>B.1</b>	<b>General</b>		<b>N/A</b>
<b>B.2</b>	<b>Test conditions</b>		<b>N/A</b>
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
	The battery system fully charged according to the manufacturer recommended conditions .....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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		N/A

<b>ANNEX C</b>	<b>PROCEDURE OF 7.3.3 PROPAGATION TEST BY METHODS OTHER THAN LASER</b>		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.....		—

<b>ANNEX D</b>	<b>PACKAGING AND TRANSPORT</b>		N/A
	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	Informative.	N/A
	Regulations concerning international transport of secondary lithium batteries		N/A



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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 <sup>1)</sup>	
Cell pouch	Xi 'an Longyuan Thermal Technology Co Ltd	BBCN-C-KT-001	Material: AL Size: 997.9mm*198mm*277mm	IEC 62619:2022	Tested with appliance.	
Electrolyte	Jiujiang Tinci MATERIALS Technology Co Ltd	BBCN-C-DJY-002	Composition: LiPF <sub>6</sub> +DMC+EMC+EC moisture: ≤20ppm acidity: ≤50ppm	IEC 62619:2022	Tested with appliance.	
Explosion vent valves	Xi 'an Chang 'an District Ruixing Chang machinery processing company	BBCN-C-XBF-001	Material: AL; Burst value: 0.7±0.1MPa; Size: ø58*30.5mm;	IEC 62619:2022	Tested with appliance.	
Positive electrode	Zhaoqing Jiye aluminum material Co Ltd	BBCN-C-Z (F) JZ-002	Material: AL; Size: 62.5*68*32.1mm ;	IEC 62619:2022	Tested with appliance.	
Negative electrode	Zhaoqing Jiye aluminum material Co Ltd	BBCN-C-Z (F) JZ-002	Material: AL; Size: 62.5*68*32.1mm ;	IEC 62619:2022	Tested with appliance.	
Electrode transfer parts	Shaanxi Huatuo Cheng Machinery Equipment Co Ltd	BBCN-C-ZJJC-002	Material: AL; Size: ø61.95*13.2mm;	IEC 62619:2022	Tested with appliance.	
<b>- Description:</b>						
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.						

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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)	Results	
A003782981-001	24.6	3.39	30.25	23.7	A, E	
A003782981-002	26.0	3.38	30.25	23.5	A, E	
A003782981-003	25.3	3.39	30.25	24.1	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
A003782981-016	2.77	4.015	3777.3	4.015	36.4	A, E
A003782981-017	2.73	4.016	3777.3	4.015	35.6	A, E
A003782981-018	2.77	4.015	3777.3	4.015	36.8	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
<b>7.2.6</b>	<b>TABLE: Forced discharge test (cell or cell block)</b>				<b>P</b>
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
A003782981-019	2.71	3.65	3777	90	A
A003782981-020	2.66	3.65	3777	90	A
A003782981-021	2.64	3.65	3777	90	A
<b>Supplementary information:</b>					
<b>Results:</b>					
A – No fire or Explosion					
B – Fire					
C – Explosion					
D – Other (Please explain): ____					

<b>7.3.2</b>	<b>TABLE: Internal short-circuit test (cell)</b>				<b>P</b>
Sample No.	OCV at start of test, (V dc)	Particle location <sup>1)</sup>	Maximum applied pressure, (N)	Results	
A003782981-022	3.42	1	400	A,E	
A003782981-023	3.40	1	400	A,E	
A003782981-024	3.42	1	400	A,E	
A003782981-025	3.41	1	400	A,E	
A003782981-026	3.42	1	400	A,E	
<b>Supplementary information:</b>					
<sup>1)</sup> 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.					
<b>Results:</b>					
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): ____					

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Clause	Requirement + Test			Result - Remark	Verdict
7.3.3	<b>TABLE: Propagation test (battery system)</b>				<b>N/A</b>
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
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--	--	--	--	--	--
--	--	--	--	--	--
Method of cell failure <sup>1)</sup>		Location of target cell		Area for fire protection (m <sup>2</sup> )	
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--		--		--	
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<b>Supplementary information:</b>					
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.					
<b>Results:</b>					
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): __					

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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
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
			<b>Charge Voltage Applied Battery System: 1)</b>		
			<b>Whole</b>	<b>Part</b>	
			--	--	

**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): \_\_\_\_

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
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**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): \_\_\_\_

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.4	<b>TABLE: Overheating control (battery system)</b>		<b>N/A</b>
Model No.	OCV at start(SOC 50%) of test, V dc	Maximum Charging Current, A	Measured Maximum Charging Voltage, V dc
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--	--	--	--
--	--	--	--
Maximum Specified Temperature of Battery System, °C		Maximum Measured Cell Case Temperature, °C	Results
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--		--	--
<b>Supplementary information:</b>			
<b>Results:</b>			
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
<b>9</b>	<b>TABLE: EMC</b>				<b>N/A</b>
Standard used for EMC test:					
Sample No.	EMC Test Item	Battery Condition	EMC Test Level/ Parameters	Compliance Criteria	Results
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<p><b>Supplementary information:</b>            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 _____</p> <p><b>Compliance Criteria and Test Results:</b>            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): _____</p>					

-- End of Test Report --