MB31 认证报告
Product Certification

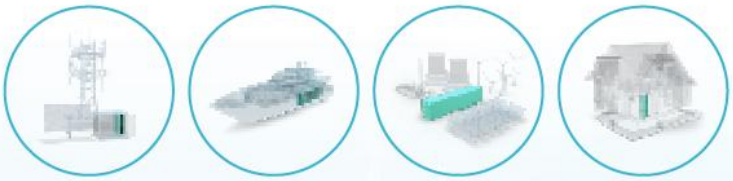
Liquid Cooling Battery Cluster

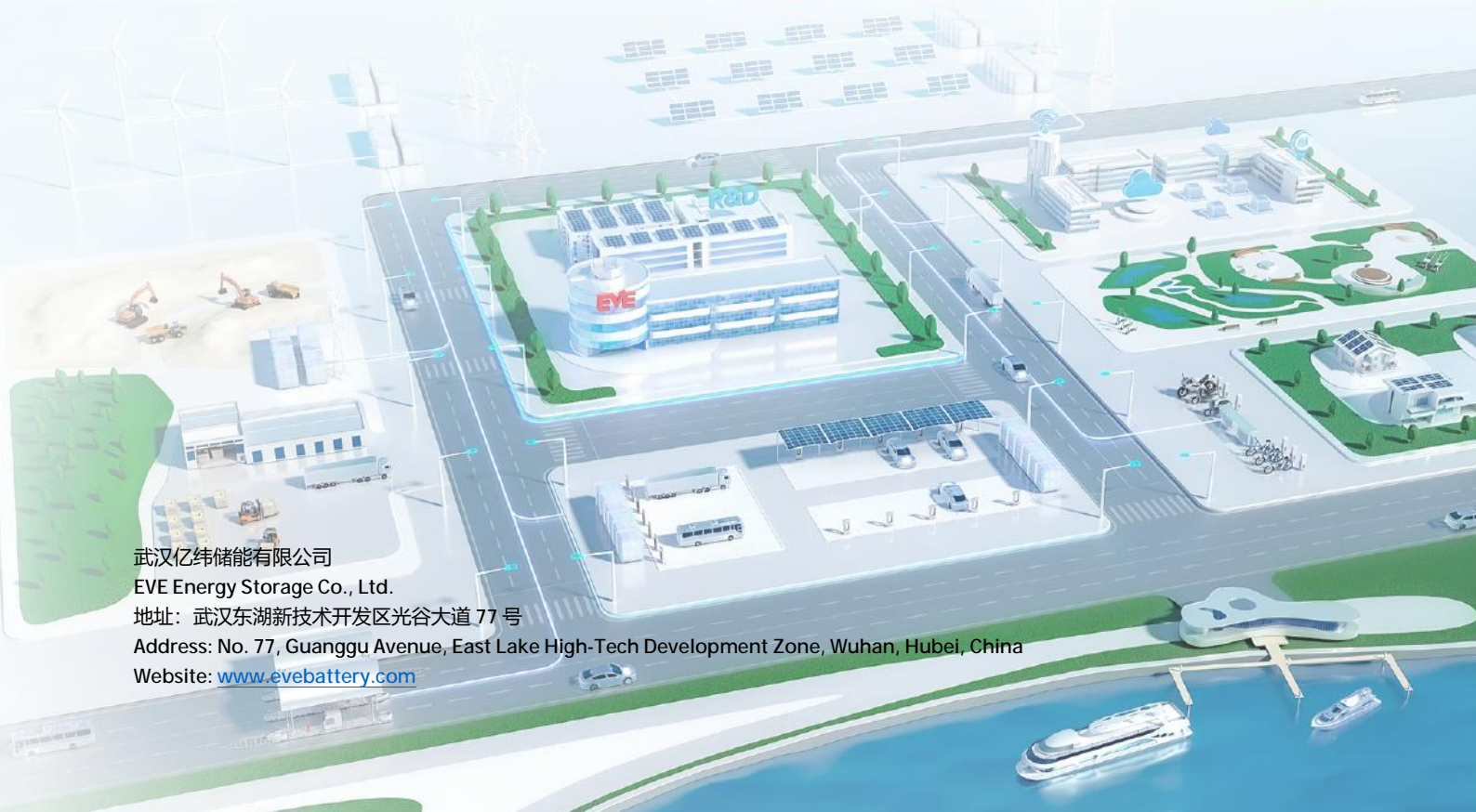
IEC62619

版本 Version V1.0

编制：解决方案中心

Prepared by: ESS Solution Centre





武汉亿纬储能有限公司
EVE Energy Storage Co., Ltd.
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武汉亿纬储能有限公司

EVE Energy Storage Co., Ltd.

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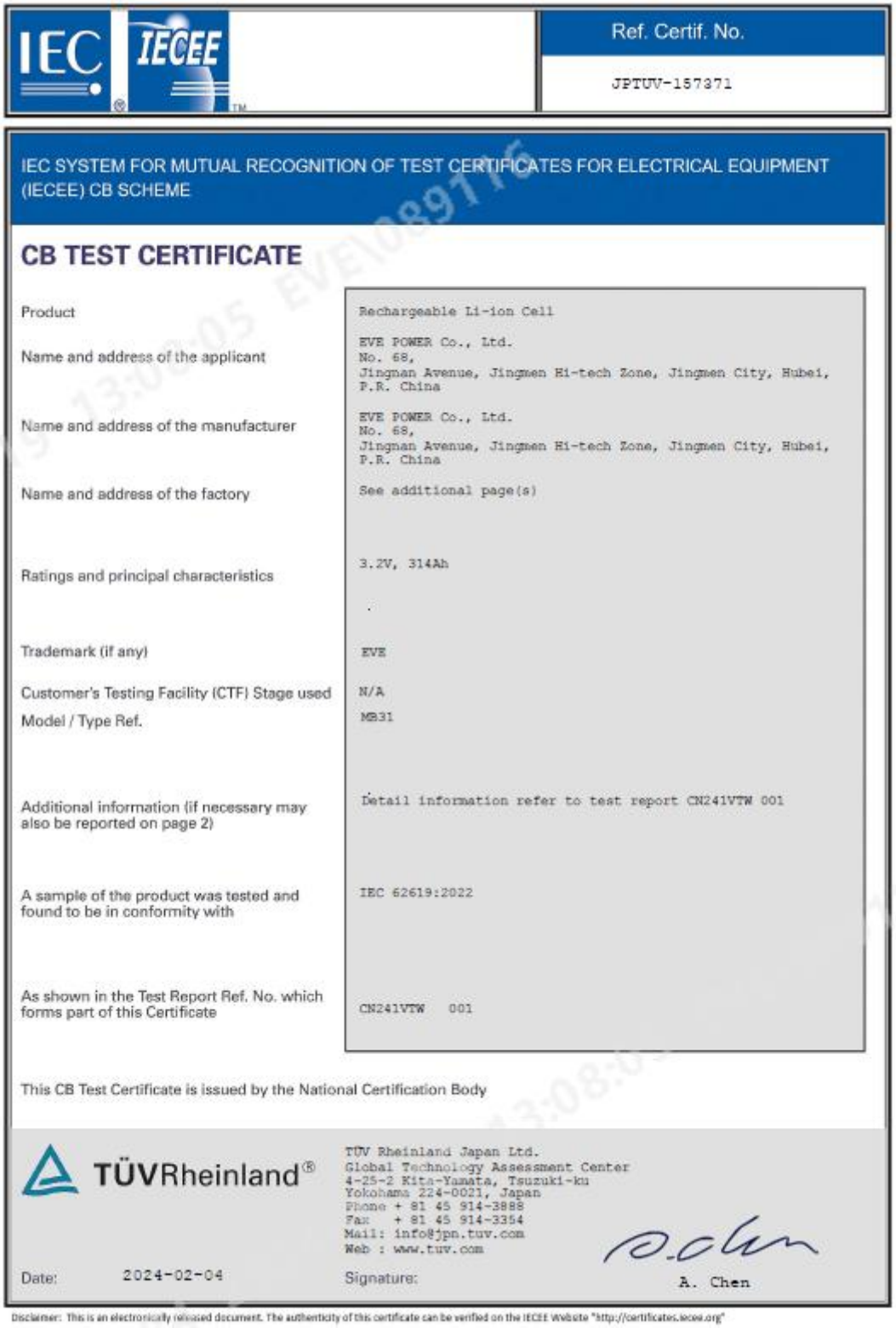
修订履历 Change history

序号 No.	版本 Version	修订日期 Date	修订内容 Contents	修订人 Revised by
1	1.0	2024-02-19	首版发行 First release	/

1. IEC62619 证书



IEC IECEE

Ref. Certif. No.

JPTUV-157371

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Rechargeable Li-ion Cell
Name and address of the applicant	EVE POWER Co., Ltd. No. 68, Jingnan Avenue, Jingmen Hi-tech Zone, Jingmen City, Hubei, P.R. China
Name and address of the manufacturer	EVE POWER Co., Ltd. No. 68, Jingnan Avenue, Jingmen Hi-tech Zone, Jingmen City, Hubei, P.R. China
Name and address of the factory	See additional page(s)
Ratings and principal characteristics	3.2V, 314Ah
Trademark (if any)	EVE
Customer's Testing Facility (CTF) Stage used	N/A
Model / Type Ref.	MB31
Additional information (if necessary may also be reported on page 2)	Detail information refer to test report CN241VTW 001
A sample of the product was tested and found to be in conformity with	IEC 62619:2022
As shown in the Test Report Ref. No. which forms part of this Certificate	CN241VTW 001

This CB Test Certificate is issued by the National Certification Body

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021, Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web : www.tuv.com

Date: 2024-02-04

Signature: A. Chen

Disclaimer: This is an electronically released document. The authenticity of this certificate can be verified on the IECEE Website "http://certificates.iecee.org"

IEC IECEE

Ref. Certif. No.

JPTUV-157371

1. EVE POWER Co., Ltd.
   No. 68,
   Jingnan Avenue, Jingmen Hi-tech Zone
   Jingmen City
   Hubei, P.R. China

2. EVE-Linyang Energy Storage Technology
   Company Limited
   No.608, Huashi Road,
   Qidong Economic Development Zone,
   Jiangsu, P.R. China

Additional information (if necessary)

Report Ref. No. : CN241VTW 001

Date: 2024-02-04

Signature: A. Chen

Disclaimer: This is an electronically released document. The authenticity of this certificate can be verified on the IECEE Website "http://certificates.iecee.org"

2. IEC62619 测试报告

Test Report issued under the responsibility of:

TÜVRheinland®

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 :	CN241VTW 001
Date of issue :	2024-02-02
Total number of pages :	20
Name of Testing Laboratory preparing the Report :	TÜV Rheinland (Shanghai) Co.,Ltd.
Applicant's name :	**EVE POWER Co., Ltd.**
Address :	No. 68 Jingnan Avenue, Jingmen Hi-tech Zone, Jingmen City, Hubei P.R. 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

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If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Rechargeable Li-ion Cell	
Trademark(s) ..... :	EVE	
Manufacturer ..... :	Same as applicant	
Model/Type reference ..... :	MB31	
Ratings ..... :	3.2V, 314Ah	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ CB Testing Laboratory:	TÜV Rheinland (Shanghai) Co.,Ltd.	
Testing location/ address ..... :	No. 177, Lane 777, West Guangzhong Road, Jing'an District, Shanghai 200072, P. R. China	
Tested by (name, function, signature) ..... :	Wilson Zhou, Project engineer	Wilson
Approved by (name, function, signature) ... :	Scola Chen, Reviewer	Scola Chen
☐ 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 1: Photo documentation (2 pages).

Summary of testing:

Tests performed (name of test, test clause and date test performed):	**Testing location: (CBTL, SPTL, CTF, Subcontractor)**
cl.7.2.1 External short circuit test (cell, 2024-01-09 to 2024-01-11) cl.7.2.2 Impact test (cell, 2024-01-10) cl.7.2.3.2 Whole drop test (cell, 2024-01-10) cl.7.2.4 Thermal abuse (cell, 2024-01-12) cl.7.2.5 Overcharging (cell, 2024-01-09 to 2024-01-12) cl.7.2.6 Forced discharge (cell, 2024-01-10 to 2024-01-12) cl.7.3.2 Internal short-circuit test (cell, 2024-01-09 to 2024-01-11) The samples comply with the requirement of IEC 62619: 2022.	**TÜV Rheinland (Shanghai) Co., Ltd.** No. 177, Lane 777, West Guangzhong Road, Jing'an District, Shanghai 200072, P. R. China

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

No EU Group Differences

☒ **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)**

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.

Rechargeable Li-ion Cell
Model name:MB31
3.2V, 314Ah, 1004.8Wh
Standard charge power: 502.4W
Max. charge voltage: 3.65V
IFpP72/174/208/M/-10+50/95
Date:xxxxxx
EVE POWER Co., Ltd

Caution:
Prohibition short circuit
Don't reverse the positive and negative terminals
Don't discard the cell in fire or heater
Don't directly solder the cell
Don't pierce the cell with a nail or other sharp object
Never disassemble the cell

可充电锂离子电池
型号名：MB31
3.2V, 314Ah, 1004.8Wh
标准充电功率：502.4W
最大充电电压：3.65V
IFpP72/174/207/M/-10+50/95
生产日期：xxxxxx

注意：
禁止电池短路
严禁颠倒正负极后使用
禁止将电芯丢入火或加热器中
禁止直接焊接电芯
禁止用钉子或其他利器刺穿电芯
在任何情况下不得拆卸电芯

TRF No. IEC62619B

Test item particulars	:
Classification of installation and use	: To be defined in the end product
Supply Connection	: Not directly connected to mains
	:
Possible test case verdicts:	
- test case does not apply to the test object	: N/A
- test object does meet the requirement	: P (Pass)
- test object does not meet the requirement	: F (Fail)
Testing	:
Date of receipt of test item	: 2024-01-09
Date (s) of performance of tests	: 2024-01-09 to 2024-01-12

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.

☐ **This Test Report Form contains requirements according to IEC/ISO ..... Standard dated ..... and includes** Corrigendum dated .....
(Note: The above text maybe removed if not applicable)

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) :	**1.EVE POWER Co., Ltd.** No. 68 Jingnan Avenue, Jingmen Hi-tech Zone, Jingmen City, Hubei, P.R. China **2.EVE-Linyang Energy Storage Technology Company Limited** No.608, Huashi Road, Qidong Economic Development Zone, Jiangsu, P.R. China

General product information and other remarks:

The main features of the cell are shown as below:

Product	Rechargeable Li-ion Cell
Type/model	MB31
Cell Capacity [Ah]	314
Cell Quantity	1PCS
Nominal voltage [V]	3.2 d c
Rated capacity [Wh]	1004.8
Upper limit charging voltage [V]	4.0
Recommend charging power [W]	502.4
Maximum charging power [W]	1004.8
Maximum charge pulse current[A]	402(10s)
Recommend discharging power [W]	502.4
Maximum discharging power [W]	1004.8
Maximum discharge pulse current[A]	402(10s)
Charge cut-off voltage [V]	3.65
Discharge cut-off voltage [V]	2.5V(T>0°C),2.0V(T≤0°C)
Temperature range for charging [°C]	0 to 65
Temperature range for discharging [°C]	-30 to 65
Temperature threshold for protection	65
Recommend charging method by manufacturer	Charge at constant power 502.4W until the voltage reaches 3.65V
Dimension [mm]	(71.7±1)*(173.7±1)*(207.2±1) T*W*H(mm) without terminal
Weight [kg]	5.6±0.3

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. See also table 5.1 for Critical components information	P
	Reduce the risk of injuries from moving parts	No such components.	N/A
5.2	**Insulation and wiring**		N/A
	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
5.3	**Venting**		**P**
	Pressure relief function	Designed in Cell.	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	Cell evaluated only.	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)	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
5.6	**Assembly of cells, modules, or battery packs into battery systems**		**P**
5.6.1	General		P
	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	Provided in specification.	P
	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	Cell evaluated only.	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..... :		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	Cell evaluated only.	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 9001:2015 certification 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	Tests were carried out in an ambient temperature of 25±5°C.	P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
7	**SPECIFIC REQUIREMENTS AND TESTS**		**P**
7.1	**Charging procedure for test purposes**		**P**
	The battery discharged to a specified final voltage prior to charging	The Cell discharged to specified final voltage 2.5V (T>0°C), 2.0V(T≤0°C).	P
	The cells or batteries charged using the method specified by the manufacturer..... :	The method mentioned in manufacturer's specifications.	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	Complied.	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)	Cell evaluated only.	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..... :	Prismatic cell	—
	Mass of the test unit (kg)..... :	5.6	—
	Height of drop (m)..... :	1.0	—
	Results: no fire, no explosion		P
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)	The mass of Cell is less than 20 kg.	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		—

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ..... :	-4.0V applied	P
	Maximum discharge current of the cell, Im..... :	402A	P
	Discharge current for forced discharge, 1.0 It ..... :	314A	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	Discharge at constant current 62.8 A until the voltage reaches 2.5V, then charge at constant power 1004.8W until the voltage reaches 4.0V.	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 ..... :	See Attachment1: 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		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

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

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	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

9	**EMC**		**N/A**
	Battery system fulfil EMC requirements of the end-device application ..... :	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	See the label	P
	Battery designation		N/A
	Battery structure formulation		N/A
12	**PACKAGING AND TRANSPORT**		N/A
	Refer to Annex D	Considered	N/A
ANNEX A	**OPERATING REGION OF CELLS FOR SAFE USE**		**P**
A.1	General	See General Product Information for details.	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 65°C	P
A.6	Low temperature range	Charging lower temperature limit 0°C	P
A.7	Discharging conditions for safe use	-30 ~ 65°C	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
	The battery system fully charged according to the manufacturer recommended conditions ..... :		—
	Target cell to be laser irradiated ..... :		—

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	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
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**		**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		N/A
	Regulations concerning international transport of secondary lithium batteries		N/A