



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..... : 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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General disclaimer:

The test results presented in this report relate only to the object tested.

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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):		
<input checked="" type="checkbox"/>	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 
Approved by (name, function, signature).... :		Scola Chen, Reviewer 
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature).... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address..... :		
Tested by (name + signature) :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	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): 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.	Testing location: (CBTL, SPTL, CTF, Subcontractor) 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 <input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN IEC 62619:2022</u> (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

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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator. <input type="checkbox"/> 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 IEC60060-2:	
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 checked="" type="checkbox"/> Yes <input type="checkbox"/> 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

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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

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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		—

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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, I_m	402A	P
	Discharge current for forced discharge, 1.0 I_t	314A	P
	Discharging time, $t = (1 I_t / I_m) \times 90$ (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 $25^\circ\text{C} \pm 5^\circ\text{C}$.		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

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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		—

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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

IEC 62619					
Clause	Requirement + Test		Result - Remark		Verdict
5.1	TABLE: Critical components information				
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
Rechargeable Lithium Ion Cell	EVE	MB31	Voltage:3.2V, Capacity: 314Ah	-	Test with battery
-Electrolyte	XZB	EL-D025/ EL-D026	Material:LiPF ₆ , EMC, PC, EC	-	-
-Separator	XY	SH11B	PE material, Double sided adhesive coating W*T:(195.5±2)mm ×13.5±3)um	-	-
-Positive electrode	YN	CFK-4	LiFePO4,Conducti ve Additive ,PVDF, Carbon black,Alumi num FoilL*W*T (15086.9±1500)m m×(191.0±5)mm×(0.176±0.02)mm	-	-
-Negative electrode	BTR	ANC-1	Graphite, CMC, SBR, Conductive Additive,Copper FoilL *W*T:((15441 ±1500)mm×(192± 5)mm×(0.133±0.0 2)mm	-	-
-Positive electrode tab	EVE	LCAG	Aluminum Foil W*T:(214±5)mm,(0.012±0.005)mm	-	-
-Negative electrode tab	HC	TJK	Material: Copper Foil W*T:(216±2 mm(0.006±0.002) mm	-	-
-Vent	KDL	KDL	Venting pressure: (0.65-0.95)MPa	-	-
-Can	KDL	KDL	Material: Aluminum Thickness 1: (0.8±0.2)mm Thickness 2: (0.6±0.2)mm	-	-
- Description:	-				
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)	Results
2024010012-001	21.3	3.34	31.3	19.8	A,E
2024010012-002	25.4	3.34	31.3	19.7	A,E
2024010012-003	25.4	3.34	31.3	21.8	A,E
Supplementary information: Result: 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
2024010012-016	2.78	3.39	336	4.015	40.35	A,E
2024010012-017	2.81	3.40	338	4.015	43.25	A,E
2024010012-018	2.80	3.39	337	4.015	39.85	A,E
Supplementary information: Comments: constant power charging(1004.8W) 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 I _t , (A)	Total Time for Reversed Charge Application (min)	Results
2024010012-019	2.84	-4.0	314	90	A
2024010012-020-	2.78	-4.0	314	90	A
2024010012-021	2.79	-4.0	314	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	
2024010012-022	3.33	1	400	A,E	
2024010012-023-	3.33	1	400	A,E	
2024010012-024	3.33	1	400	A,E	
2024010012-025	3.33	1	400	A,E	
2024010012-026-	3.33	1	400	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): ____					

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 (m²)	
-		-		-	
-		-		-	
-		-		-	
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): ____					

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): _____					

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Clause	Requirement + Test	Result - Remark	Verdict
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): _____			

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Clause	Requirement + Test	Result - Remark	Verdict		
9	TABLE: EMC				N/A
Standard used for EMC test:					
Sample No.	EMC Test Item	Battery Condition	EMC Test Level/ Parameters	Compliance Criteria	Results
-	-	-	-	-	-
<p>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 ____</p> <p>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): ____</p>					

-The end of the report-