TEST REPORT
J62133(H28)
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Report Number.....:	S03A21040229P01001
Date of issue.....:	May 12, 2021
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Applicant's name.....:	SHENZHEN GENJU TECHNOLOGY CO., LTD
Address.....:	Room 208, Building B, NO.7 East, Shangxue industrial park, Bantian Buji, longgang district, shenzhen, China
Test specification:	
Standard.....:	☒ J62133(H28)
Test item description.....:	Li-ion Cell
Trade Mark.....:	N/A
Manufacturer.....:	Same as applicant.
Address.....:	Same as applicant.
Factory.....:	Same as applicant.
Address.....:	Same as applicant.
Model/Type reference.....:	SAFD18650 25HR
Ratings.....:	3.6V, 2500mAh, 9Wh

List of Attachments (including a total number of pages in each attachment):

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Summary of testing:

The unit is charging the empty cell and discharging the full charged cell according to the rating.

Note:

Charging procedures for test purposes:

(1) Unless otherwise stated, the charging procedure for test purposes is carried out in an ambient temperature of 20±5°C, using the method declared by the manufacturer. Prior to charging, the battery/cell shall have been discharged at 20±5°C at a constant current of 0.2 It A down to a specified final voltage.

(2) After stabilization for 1 to 4 hours respectively at ambient temperature of highest test temperature 50°C and lowest test temperature 0°C.

Tests performed (name of test and test clause):	**Testing location:**
- 8.1.1 Charging procedures for test purposes (First procedure) - 8.1.2 Charging procedures for test purposes (Second procedure) - 8.2.1 Continuous charging test (cells) - 8.3.1 External short circuit test (cells) - 8.3.3 Free fall test - 8.3.4 Thermal abuse test (cells) - 8.3.5 Crush test (cells) - 8.3.7 Forced discharge test (cells) - 8.3.8 Transport tests(cells) - 8.3.9 Forced internal short test (cells)	Guangdong ESTL Technology Co., Ltd. Room 101, 201-208, Unit 1, Building 1, No. 9 Head quarters 2nd Road, Songshan Lake Park, Donggua n, Guangdong, China.

Summary of compliance with National Differences: N/A

Copy of marking plate

+	SAFD18650 25HR ICR19/66 3.6V 2500mAh 9Wh Li-ion Cell
-	YYMMDD
	SHENZHEN GENJU TECHNOLOGY CO., LTD

Remark: 1.“YY” means to years; “MM” means to months; “DD” means to days.

Test item particulars..... :	N/A
Classification of installation and use.....:	To be defined in final product
Supply connection.....:	N/A
Recommend charging method declaired by the manufacturer.....:	CC/CV
Discharge current (0,2 I_t A) .....:	500mA
Specified final voltage..... :	2.5V
Chemistry .....:	☐ nickel systems.....☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	4.2V(Test for 4.25V)
Maximum charging current..... :	4000mA
Charging temperature upper limit.....:	50°C
Charging temperature lower limit..... :	0°C
Polymer cell electrolyte type.....:	☐ gel polymer..... ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A (Not Applicable)
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing..... :	
Date of receipt of test item.....:	Apr. 15, 2021
Date (s) of performance of tests.....:	Apr. 16, 2021 to May 08, 2021

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(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.

General product information:

Single cell

The main features of the cell in the battery are shown as below:

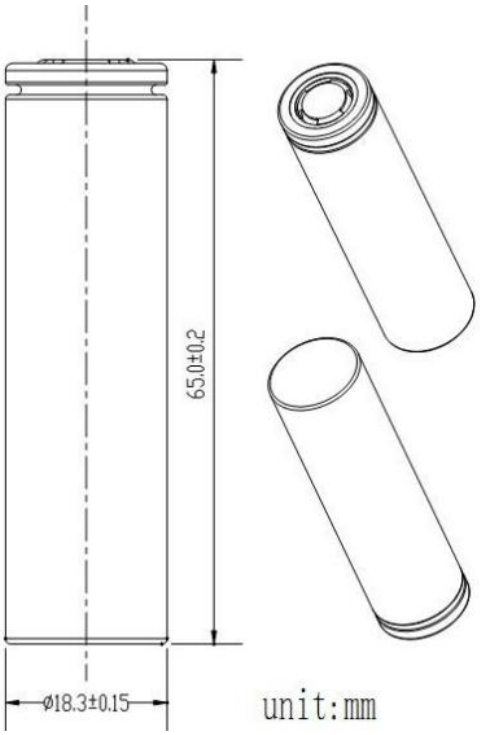
Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Limited Charge Voltage	Cut-off Voltage
SAFD18650 25HR	2500mAh	3.6V	1250mA	500mA	4000mA	25000mA	4.2V	2.5V

The main features of the cell in the battery are shown as below:

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
SAFD18650 30HQ	4.2V (Test for 4.25V)	50mA	0°C	50°C

Construction:

Cell:



Max. 18.45mm (Φ) x Max. 65.2mm (H)

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances	All control and measure values were within the tolerances.	P
5	**General safety considerations**		**P**
5.1	General	See below.	P
5.2	Insulation and wiring		N/A
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ		N/A
	Insulation resistance (MΩ)..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		N/A
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		N/A
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		N/A
5.3	Venting	See below.	P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Top side of the cylindrical cell	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief	No such outer case used, and will be evaluated in the final product.	N/A
5.4	Temperature/voltage/current management	Cell only.	N/A
	Batteries are designed such that abnormal temperature rise conditions are prevented		N/A
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		N/A
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified		N/A
5.5	Terminal contacts		P
	Terminals have a clear polarity marking on the external surface of the battery	DC Teminal used.	P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short circuits		N/A
5.6	Assembly of cells into batteries	Cell only.	N/A
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	Each battery has an independent control and protection		N/A
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N/A
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges		N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		N/A
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N/A
5.6.2	Design recommendation for lithium systems only		N/A
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or		N/A
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N/A
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
5.7	Quality plan	See below	P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	Quality plan was submitted which cover both design and processes of the product.	P
6	**Type test conditions**		**P**
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Tests are performed according to specified in Table 2 of the standard.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	The test are conducted in an ambient of 15°C to 25°C.	P
7	**Specific requirements and tests (nickel systems)**		**N/A**
7.1	Charging procedure for test purposes	lithium systems battery	N/A
7.2	Intended use	lithium systems battery	N/A
7.2.1	Continuous low-rate charging (cells)	lithium systems battery	N/A
	Results: No fire. No explosion	lithium systems battery	N/A
7.2.2	Vibration	lithium systems battery	N/A
	Results: No fire. No explosion. No leakage	lithium systems battery	N/A
7.2.3	Moulded case stress at high ambient temperature	lithium systems battery	N/A
	Oven temperature (°C)..... :		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Results: No physical distortion of the battery casing resulting in exposure if internal components	lithium systems battery	N/A
7.2.4	Temperature cycling	lithium systems battery	N/A
	Results: No fire. No explosion. No leakage.	lithium systems battery	N/A
7.3	Reasonably foreseeable misuse	lithium systems battery	N/A
7.3.1	Incorrect installation cell	lithium systems battery	N/A
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or	lithium systems battery	N/A
	- A stabilized dc power supply.	lithium systems battery	N/A
	Results: No fire. No explosion..... :	lithium systems battery	N/A
7.3.2	External short circuit	lithium systems battery	N/A
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or	lithium systems battery	N/A
	- The case temperature declined by 20% of the maximum temperature rise	lithium systems battery	N/A
	Results: No fire. No explosion..... :	lithium systems battery	N/A
7.3.3	Free fall	lithium systems battery	N/A
	Results: No fire. No explosion.	lithium systems battery	N/A
7.3.4	Mechanical shock (crash hazard)	lithium systems battery	N/A
	Results: No fire. No explosion. No leakage.	lithium systems battery	N/A
7.3.5	Thermal abuse	lithium systems battery	N/A
	Oven temperature (°C).....:		—
	Results: No fire. No explosion.	lithium systems battery	N/A
7.3.6	Crushing of cells	lithium systems battery	N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or	lithium systems battery	N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained	lithium systems battery	N/A
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set	lithium systems battery	N/A
	Results: No fire. No explosion..... :	lithium systems battery	N/A
7.3.7	Low pressure	lithium systems battery	N/A
	Chamber pressure (kPa).....:		—

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Results: No fire. No explosion. No leakage.	lithium systems battery	N/A
7.3.8	Overcharge	lithium systems battery	N/A
	Results: No fire. No explosion..... :	lithium systems battery	N/A
7.3.9	Forced discharge	lithium systems battery	N/A
	Results: No fire. No explosion..... :	lithium systems battery	N/A

8	**Specific requirements and tests (lithium systems)**		**P**
8.1	Charging procedures for test purposes	See below	P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2		P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9	See below	P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit		P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)..... :	- Specified charge temperature 0-50°C; - Tested upper limit temperature: 55°C; - Tested lower limit temperature: -5°C;	P
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly		P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1)..... :	4.2V(Test for 4.25V)	P
8.2	Intended use	See below	P
8.2.1	Continuous charging at constant voltage (cells)	Complied	P
	Results: No fire. No explosion..... :	(See Table 8.2.1)	P
8.2.2	Moulded case stress at high ambient temperature (battery)	No moulded case used.	N/A
	Oven temperature (°C)..... :	70°C	—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A
8.3	Reasonably foreseeable misuse	See below	P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
8.3.1	External short circuit (cell)	See below	P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)	Cell only.	N/A
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	Results: No fire. No explosion..... :		P
8.3.3	Free fall	See below	P
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.4	Thermal abuse (cells)	See below	P
	The cells were held at 130°C ± 2°C for: - 10 minutes; or		P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)	Not large cells	N/A
	Oven temperature (°C).....:	130.0°C	—
	Gross mass of cell (g).....:	Small cell (<500g)	—
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.5	Crush (cells)	See below	P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	- 10% of deformation has occurred compared to the initial dimension		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.2)	P
8.3.6	Over-charging of battery	See below	N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		N/A
	- Returned to ambient		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.6)	N/A
8.3.7	Forced discharge (cells)		P
	Results: No fire. No explosion..... :	(See Table 8.3.7)	P
8.3.8	Transport tests		P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods		P
8.3.9	Design evaluation – Forced internal short circuit (cells)	See below	P
	The cells complied with national requirement for.....:	France, Japan, Korea and Switzerland	—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		P
	Results: No fire..... :	(See Table 8.3.9)	P
9	**Information for safety**		**P**
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Provided in cell specification	P
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.	Provided in cell specification and safety instruction	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product	Provided in cell specification and safety instruction	P
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user.....:		N/A
10	**Marking**		**P**
10.1	Cell marking		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.		P
10.2	Battery marking	Cell only.	N/A
	Batteries marked in accordance with the requirements for the cells from which they are assembled.		N/A
	Batteries marked with an appropriate caution statement.		N/A
10.3	Other information		P
	Storage and disposal instructions marked on or supplied with the battery.	In cell technical documents	P
	Recommended charging instructions marked on or supplied with the battery.	In cell technical documents	P

11	**Packaging**		**P**
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants.		P

Annex A	**Charging range of secondary lithium ion cells for safe use**		**P**
A.1	General		P
A.2	Safety of lithium-ion secondary battery	Complied.	P
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.2V(Test for 4.25V)	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		N/A
A.4	Consideration of temperature and charging current		P
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is: 0-50°C	P
A.4.3	High temperature range		P
A.4.3.1	General		P

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
A.4.3.2	Explanation of safety viewpoint		P
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		P
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		P
A.4.4	Low temperature range		P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		P
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		P
A.5.5.1	Insertion of nickel particle to winding core		P
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		P
A.5.6	Insertion of nickel particle to prismatic cell	Cylindrical cell	N/A

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

--	**TABLE: Critical components information**				**P**
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Cell	SHENZHEN GENJU TECHNOLOGY CO., LTD	SAFD18650 25HR	3.6V, 2500mAh	J62133(H28)	Test with equipment
-Positive Electrode	Dangsheng	LCO-12B	LiC_OO_2, Carbon, black, NMP, PVDF, Conductive additive	--	Tested with appliance
-Negative Electrode	Sinuo	MAG-4	Graphite, CMC, SBR, Distilled Water, Conductive additive	--	Tested with appliance
-Separator	Dongguan Shanshan Technical Jonit-stock Co., Ltd.	LD-1129	$LiPF_6$+DMC+EMC+EC, Shut down temperature: 130°C	--	Tested with appliance
-Electrolyte	Fushan Jinhui Hi-tech	Jh20	LIPF6, Shut down temperature: 130°C	--	Tested with appliance
Supplementary information: **[1)] Provided evidence ensures the agreed level of compliance.**					

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

7.2.1	TABLE: Continuous low rate charge (cells)				N/A
Model	**Recommended charging method, (CC, CV, or CC/CV)**	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**
--	--	--	--	--	--
Supplementary information: - No fire or explosion					

7.2.2	TABLE: Vibration		N/A
Model	**OCV at start of test, (Vdc)**	**Results**	
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Supplementary information: - No fire or explosion - No leakage			

7.3.1	TABLE: Incorrect installation (cells)		N/A
Model	**OCV of reversed cell, (Vdc)**	**Results**	
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Supplementary information: - No fire or explosion			

7.3.2	TABLE: External short circuit					N/A
Model	**Ambient (at 20°C ± 5ºC or 55°C ± 5°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, (°C)**	**Results**	
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Supplementary information: - No fire or explosion						

7.3.6	TABLE: Crush			N/A
Model	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Results**	
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Supplementary information: - No fire or explosion				

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Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

7.3.8	TABLE: Overcharge				N/A
Model	**OCV prior to charging, (Vdc)**	**Maximum charge current, (A)**	**Time for charging, (hours)**	**Results**	
--	--	--	--	--	
Supplementary information: - No fire or explosion					

7.3.9	TABLE: Forced discharge (cells)				N/A
Model	**OCV before application of reverse charge, (Vdc)**	**Measured reverse charge I_t, (A)**	**Time for reversed charge, (minutes)**	**Results**	
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Supplementary information: - No fire or explosion					

8.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Number of sample	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**
C1#	4.2	1.25	4.184	P
C2#	4.2	1.25	4.182	P
C3#	4.2	1.25	4.185	P
C4#	4.2	1.25	4.181	P
C5#	4.2	1.25	4.183	P
Supplementary information: - No fire or explosion - No leakage				

8.3.1	TABLE: External short circuit (cell)				P
Number of sample	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (mΩ)**	**Maximum case temperature rise ΔT, (°C)**	**Results**
Samples charged at charging temperature upper limit (55°C)					
C6#	55.4	4.184	76	45.2	P
C7#	55.4	4.182	71	49.7	P
C8#	55.4	4.184	82	45.6	P

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Clause	**Requirement + Test**			**Result - Remark**	**Verdict**
C9#	55.4	4.185	88	48.1	P
C10#	55.3	4.184	90	52.2	P
Samples charged at charging temperature lower limit (-5°C)					
C11#	55.3	4.142	78	53.8	P
C12#	55.4	4.141	77	61.9	P
C13#	55.4	4.142	92	60.6	P
C14#	55.3	4.143	84	45.1	P
C15#	55.3	4.141	87	64.4	P
Supplementary information: - No fire or explosion					

8.3.2	**TABLE: External short circuit (battery)**				**N/A**
Number of sample	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (mΩ)**	**Maximum case temperature rise ΔT, (°C)**	**Results**
Samples charged at charging temperature upper limit (°C)					
B4#	--	--	--	--	--
B5#	--	--	--	--	--
B6#	--	--	--	--	--
B7#	--	--	--	--	--
B8#	--	--	--	--	--
Samples charged at charging temperature lower limit (°C)					
B9#	--	--	--	--	--
B10#	--	--	--	--	--
B11#	--	--	--	--	--
B12#	--	--	--	--	--
B13#	--	--	--	--	--
Supplementary information: - No fire or explosion					

8.3.5	**TABLE: Crush**				**P**
Number of sample	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Width/ diameter of cell before crush, (mm)**	**Required deformation for crush, (mm)**	**Results**
Samples charged at charging temperature upper limit (55°C)					
C29#	4.189	--	--	--	P

J62133(H28)			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**

C30#	4.187	--	--	--	P
C31#	4.182	--	--	--	P
C32#	4.187	--	--	--	P
C33#	4.186	--	--	--	P
Samples charged at charging temperature lower limit (-5°C)					
C34#	4.143	--	--	--	P
C35#	4.144	--	--	--	P
C36#	4.142	--	--	--	P
C37#	4.142	--	--	--	P
C38#	4.142	--	--	--	P

Supplementary information:
- No fire or explosion

8.3.6	TABLE: Over-charging of battery		N/A
Constant charging current (A).....:			—
Supply voltage (Vdc).....:			—

Number of sample	OCV before charging, (Vdc)	Resistance of circuit, (Ω)	Maximum outer casing temperature, (°C)	Results
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

Supplementary information:
- No fire or explosion

8.3.7	TABLE: Forced discharge (cells)			P

Number of sample	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_t, (mA)	Time for reversed charge, (minutes)	Results
C39#	2.841	2500	90	P
C40#	2.833	2500	90	P
C41#	2.835	2500	90	P
C42#	2.842	2500	90	P

J62133(H28)				
Clause	**Requirement + Test**		**Result - Remark**	**Verdict**
C43#	2.839	2500	90	P

Supplementary information:

- No fire or explosion

8.3.9	TABLE: Forced internal short circuit (cells)				P
Number of sample	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Results**
C54#	55	4.185	1	800	P
C55#	55	4.187	1	800	P
C56#	55	4.183	1	800	P
C57#	55	4.182	1	800	P
C58#	55	4.187	1	800	P
C59#	-5	4.141	1	800	P
C60#	-5	4.143	1	800	P
C61#	-5	4.142	1	800	P
C62#	-5	4.143	1	800	P
C63#	-5	4.139	1	800	P

Supplementary information:

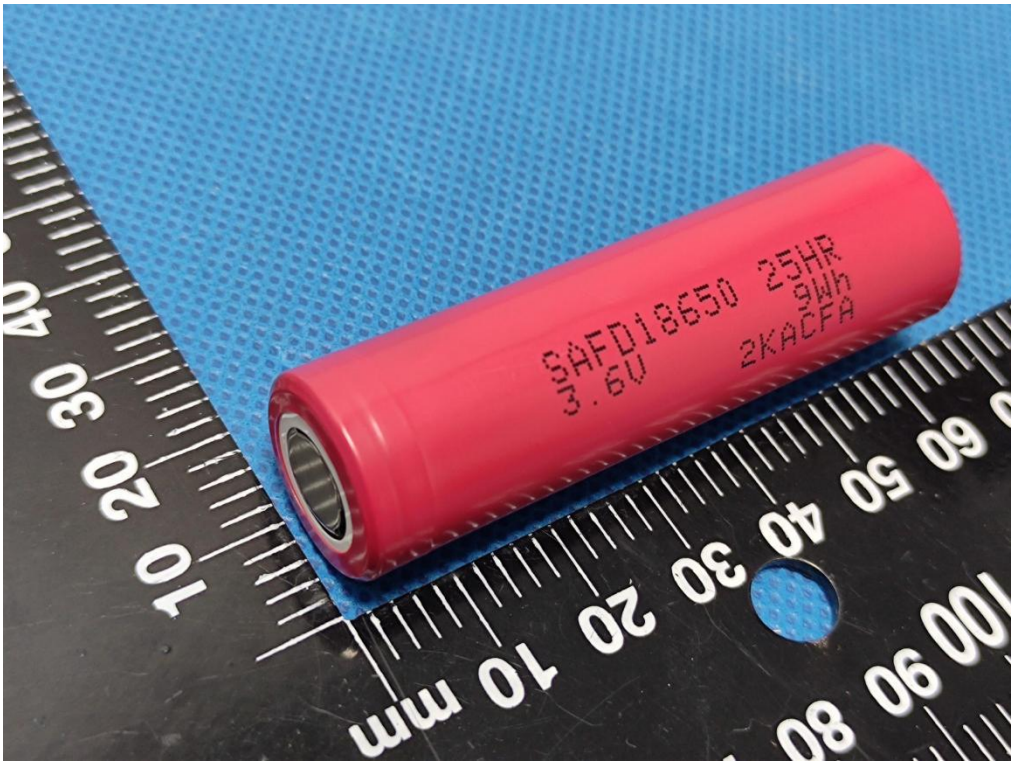
[1)] Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

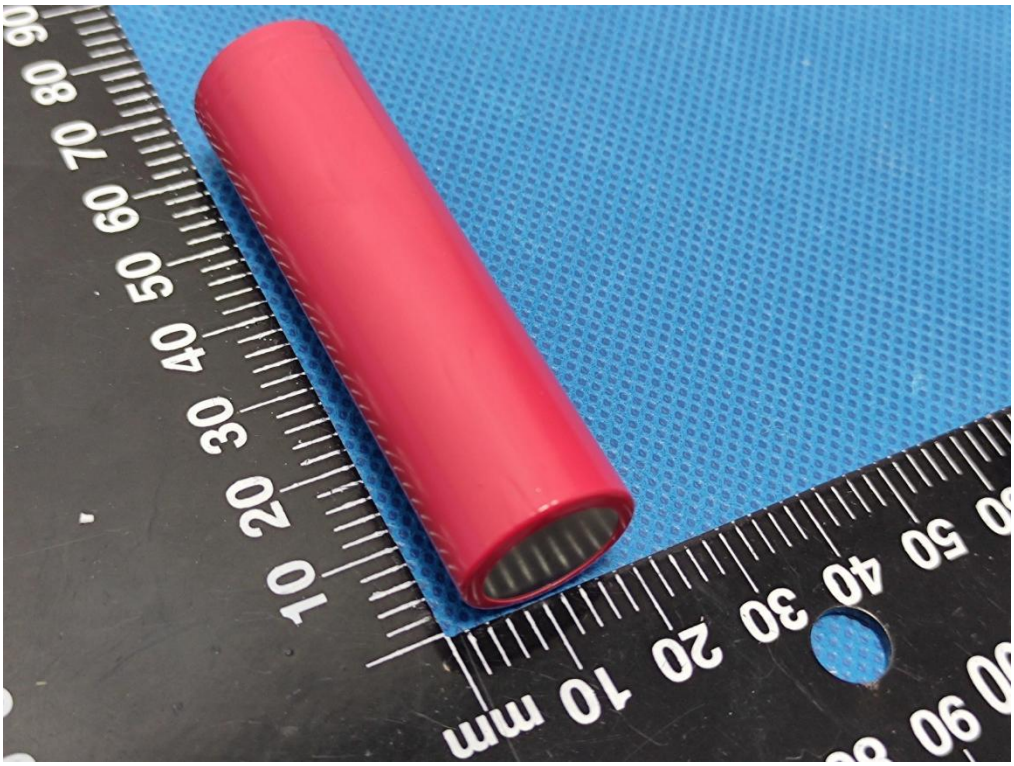
2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire

Photo



General view – 1



General view – 2

--- End of Report ---