Test Report issued under the responsibility of:

TEST REPORT
IEC 62133-2
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 –
Part 2: Lithium systems

Report Number. ..... :	SHES210300411701
Date of issue..... :	2021-03-17
Total number of pages ..... :	26 Pages
Name of Testing Laboratory preparing the Report ..... :	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Applicant's name..... :	Hengdian Group DMEGC Magnetics Co., Ltd.
Address..... :	Hengdian Industrial Zone, Dongyang, Jinhua, Zhejiang, China
Test specification:	
Standard ..... :	IEC 62133-2:2017
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62133_2A
Test Report Form(s) Originator.... :	DEKRA
Master TRF..... :	Dated 2017-08-10

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Test item description..... :	Rechargeable Li-ion Cell
Trade Mark..... :	DMEGC
Manufacturer..... :	Same as applicant
Model/Type reference..... :	INR18650-29EA, INR18650-29E
Ratings..... :	See page 6

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.	
Testing location/ address.....:		588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China	
Tested by (name, function, signature).....:		Vivian Ni / Project Engineer	Vivian Ni
Approved by (name, function, signature)...:		Eric Wang / Project Reviewer	
☐	**Testing procedure: CTF Stage 1:**	N/A	
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**	N/A	
Testing location/ address.....:			
Tested by (name + signature) .....:			
Witnessed by (name, function, signature)..:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**	N/A	
☐	**Testing procedure: CTF Stage 4:**	N/A	
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: 2 pages of Photos;

Attachment 2: 1 page of Information for safety;

Attachment 3: 1 page of Packaging;

Attachment 4: 1 page of Product specification;

Attachment 5: 1 page of ISO9001 certificate.

Summary of testing:

The sample(s) tested complies with the requirements of IEC 62133-2: 2017.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Remark:

Cells were considered and tested according to standard in this report.

Full tests were conducted on both cell models INR18650-29E, INR18650-29EA.

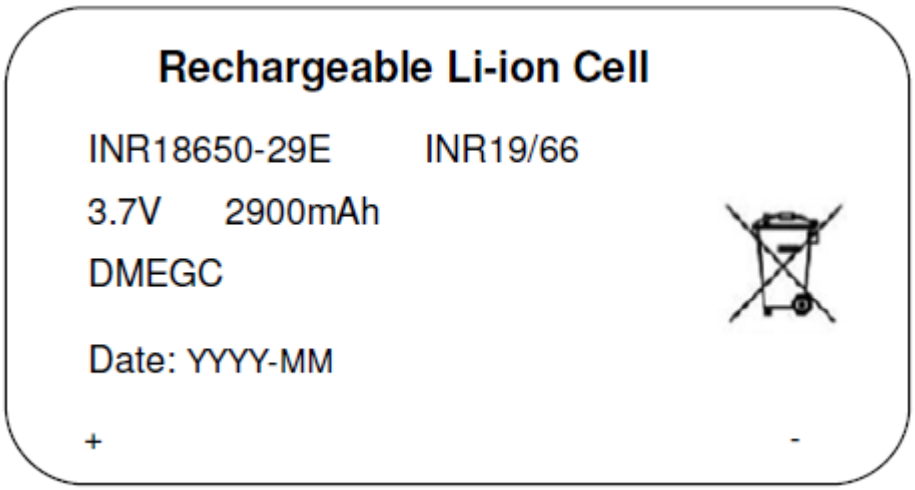
Tests performed (name of test and test clause):	**Testing location:**
☐5.2 Insulation resistance ☒7.2.1 Continuous charging at constant voltage (cells) ☐7.2.2 Case stress at high ambient temperature (battery) ☒7.3.1 External short circuit (cell) ☐7.3.2 External short circuit (battery) ☒7.3.3 Free fall ☒7.3.4 Thermal abuse (cells) ☒7.3.5 Crush (cells) ☐7.3.6 Over-charging of battery ☒7.3.7 Forced discharge (cells) ☐7.3.8. Mechanical tests (batteries) ☒7.3.9 Design evaluation – Forced internal short circuit (cells) ☐Annex D Measurement of the internal AC resistance for coin cells	SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China For 7.3.9: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch No.2, Jianghao Industrial Factory Area, No.430, Jihua Road, Bantian Street, Longgang District, Shenzhen, Guangdong, China

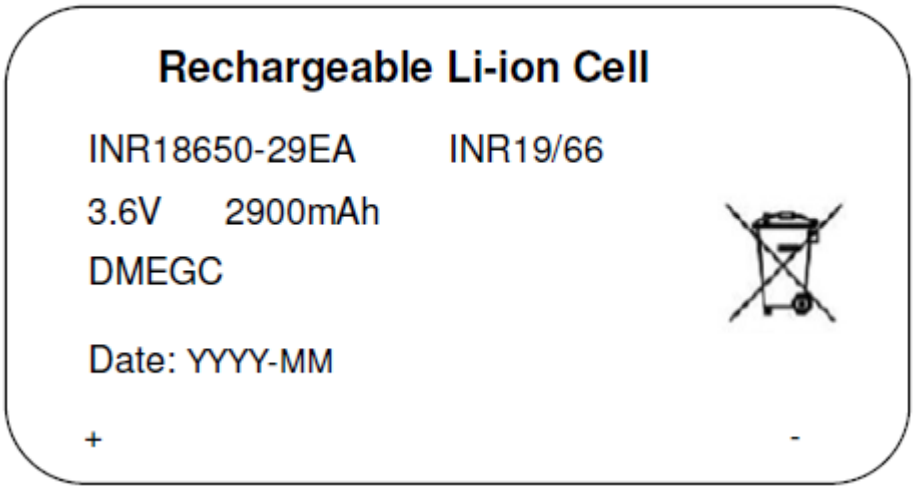
Summary of compliance with National Differences (List of countries addressed): None

☒ The product fulfils the requirements of EN 62133-2:2017

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.





Remark:

Date code: YYYY for year, MM for month.

Test item particulars .....:	--
Classification of installation and use.....:	--
Supply Connection .....:	--
Recommend charging method declared by the manufacturer.....:	0,5C CC charge to 4,2 V, then CV charge till charge current decline to ⩽0,05C
Discharge current (0,2 It A).....:	580 mA
Specified final voltage.....:	2,7 V
Upper limit charging voltage per cell.....:	4,25 V
Maximum charging current.....:	5800 mA
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
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing .....:	
Date of receipt of test item.....:	2021-03-01
Date (s) of performance of tests .....:	2021-03-01 to 2021-03-16

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ **Yes** ☒ **Not applicable**

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

Name and address of factory (ies)..... : Same as applicant

General product information and other remarks:

Product description:	Rechargeable Li-ion Cell	
Model of cell:	INR18650-29EA	INR18650-29E
Designation of cell:	INR19/66	INR19/66
Rated voltage:	3,6 V	3,7 V
Rated capacity:	2900 mAh	2900 mAh
Maximum charge current:	5800 mA	5800 mA

Remark:

See Attachment 4 for more details.

All above models with same size and capacity are identical expect for rated voltage and model name.

IEC 62133-2			
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 so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	**Insulation and wiring**	Considered in Battery Pack	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 clearance and creepage distances between conductors		N/A
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	**Venting**		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	Cell: A pressure relief mechanism used to relieve excessive internal pressure.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief	Considered in Battery Pack	N/A
5.4	**Temperature, voltage and current management**	Considered in Battery Pack	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 specified chargers are designed to maintain charging within the temperature, voltage and current limits specified		N/A
5.5	**Terminal contacts**		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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-circuit		P
5.6	**Assembly of cells into batteries**	Considered in Battery Pack	N/A
5.6.1	General		N/A
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region		N/A
	This protection may be provided external to the battery such as within the charger or the end devices		N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions		N/A
	Manufacturers of cells specify 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 circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		N/A
	Protective circuit components added as appropriate and consideration given to the end-device application		N/A
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance		N/A
5.6.2	Design recommendation		N/A
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, 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, it is recommended that charging is stopped when the upper limit of the charging voltage 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
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		N/A
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		N/A
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage		N/A
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		N/A
5.6.3	Mechanical protection for cells and components of batteries	Considered in Battery Pack	N/A
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse		N/A
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product		N/A
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		N/A
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests		N/A
5.7	**Quality plan**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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	The manufacturer provides ISO9001 certificate	P
5.8	**Battery safety components**		P
	According annex F		P
6	**TYPE TEST AND SAMPLE SIZE**		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old	Test are performed according to test items specified in table 1 of the standard.	P
	Coin cells with resistance ≤ 3 Ω (measured according annex D) are tested according table 1		N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of 20 °C ± 5 °C	The tests are conducted in an ambient of 20°C ± 5°C.	P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		N/A
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test		N/A
7	**SPECIFIC REQUIREMENTS AND TESTS**		P
7.1	**Charging procedure for test purposes**		P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of 20 °C ± 5 °C, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at 20 °C ± 5 °C at a constant current of 0,2 It A down to a specified final voltage		P
7.1.2	Second procedure		P
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P

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Clause	Requirement + Test	Result - Remark	Verdict
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant voltage charging method		P
7.2	**Intended use**		P
7.2.1	Continuous charging at constant voltage (cells)		P
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer		P
	Results: No fire. No explosion. No leakage ..... :	(See appended table 7.2.1)	P
7.2.2	Case stress at high ambient temperature (battery)		N/A
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		N/A
7.3	**Reasonably foreseeable misuse**		P
7.3.1	External short-circuit (cell)		P
	The cells were tested until one of the following occurred:		P
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		P
	Results: No fire. No explosion .....:	(See appended table 7.3.1)	P
7.3.2	External short-circuit (battery)		N/A
	The batteries 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
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		N/A
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor		N/A
	Results: No fire. No explosion .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
7.3.3	Free fall		P
	Results: No fire. No explosion		P
7.3.4	Thermal abuse (cells)		P
	Oven temperature (°C) ..... :	130	—
	Results: No fire. No explosion		P
7.3.5	Crush (cells)		P
	The crushing force was released upon:		P
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		P
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: No fire. No explosion .....:	(See appended table 7.3.5)	P
7.3.6	Over-charging of battery		N/A
	The supply voltage which is:		—
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or		N/A
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		N/A
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		N/A
	Test was continued until the temperature of the outer casing:		N/A
	- 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 .....:		N/A
7.3.7	Forced discharge (cells)		P
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		P
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		N/A
	Results: No fire. No explosion .....:	(See appended table 7.3.7)	P
7.3.8	Mechanical tests (batteries)		N/A
7.3.8.1	Vibration		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire, no explosion, no rupture, no leakage or venting. .....:		N/A
7.3.8.2	Mechanical shock		N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire.....:		N/A
7.3.9	Design evaluation – Forced internal short-circuit (cells)		P
	The cells complied with national requirement for ..... :	France, Japan, Republic of Korea, 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	800N for cylindrical cells	P
	Results: No fire.....:	(See appended table 7.3.9)	P
8	**INFORMATION FOR SAFETY**		P
8.1	**General**		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	See Attachment 4 for detail	P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards	See Attachment 2 for detail	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		P
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user	Not for end user	N/A
	Do not allow children to replace batteries without adult supervision		N/A
8.2	**Small cell and battery safety information**		N/A
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		N/A
	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9	**MARKING**		P
9.1	**Cell marking**		P
	Cells marked as specified in IEC 61960, except coin cells		P
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		N/A
9.2	**Battery marking**		N/A
	Batteries marked as specified in IEC 61960, except for coin batteries		N/A
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement		N/A
	Terminals have clear polarity marking on the external surface of the battery		N/A
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		N/A
9.3	**Caution for ingestion of small cells and batteries**		N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	**Other information**		P
	Storage and disposal instructions	Storage and disposal instructions were supplied with the battery. See attachment 2 for detail.	P
	Recommended charging instructions	Recommended charging instructions were supplied with the battery. See attachment 4 for detail.	P
10	**PACKAGING AND TRANSPORT**		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3		N/A
	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	See attachment 3 for detail.	P
ANNEX A	**CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE**		**P**
A.1	**General**		P
A.2	**Safety of lithium ion secondary battery**		P
A.3	**Consideration on charging voltage**		P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4,25 V	P
A.3.2.1	General		P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		P
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	—
A.4.2.1	General		
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature declared by client is 0°C~50°C	P
A.4.3	High temperature range	Charging high temperature declared by client is 50°C	P
A.4.3.1	General		P
A.4.3.2	Explanation of safety viewpoint		P
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		P
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		P
A.4.4	Low temperature range	Charging low temperature declared by client is 0°C	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 the low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		P

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Clause	Requirement + Test	Result - Remark	Verdict
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		P
A.4.6.3	Discharge current and temperature range		P
A.4.6.4	Scope of application of the discharging 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
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle in cylindrical cell		P
A.5.5.1	Insertion of nickel particle in winding core		P
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		P
A.5.6	Insertion of nickel particle in prismatic cell		N/A
A.6	**Experimental procedure of the forced internal short-circuit test**		P
A.6.1	Material and tools for preparation of nickel particle		P
A.6.2	Example of a nickel particle preparation procedure		P
A.6.3	Positioning (or placement) of a nickel particle		P
A.6.4	Damaged separator precaution		P
A.6.5	Caution for rewinding separator and electrode		P
A.6.6	Insulation film for preventing short-circuit		P
A.6.7	Caution when disassembling a cell		P
A.6.8	Protective equipment for safety		P
A.6.9	Caution in the case of fire during disassembling		P
A.6.10	Caution for the disassembling process and pressing the electrode core		P
A.6.11	Recommended specifications for the pressing device		P
ANNEX B	**RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS**		**P**
ANNEX C	**RECOMMENDATIONS TO THE END-USERS**		**N/A**

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX D	**MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS**		**N/A**
D.1	**General**		N/A
D.2	**Method**		N/A
	A sample size of three coin cells is required for this measurement.....:	(See appended table D.2)	N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	**PACKAGING AND TRANSPORT**		**P**
ANNEX F	**COMPONENT STANDARDS REFERENCES**		**N/A**

IEC 62133-2			
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)]**
INR18650-29EA					
Cell	Hengdian Group DMEGC Magnetics Co., Ltd.	INR18650-29EA	3,6 V, 2900 mAh	IEC 62133-2: 2017 EN 62133-2:2017	Tested with appliance
- Electrolyte	Shenzhen Capchem Technology Co., Ltd.	--	EC/EMC/DMC/LiPF6	--	Tested with appliance
- Separator	Cangzhou Mingzhu Plastic Co., Ltd.	16 um*61mm	Material: PE, Coating Film Shutdown temperature: 138±10°C	--	Tested with appliance
- Positive material	XingXiang TianLi Energy Co., Ltd.	NCM	NCM	--	Tested with appliance
- Negative material	Jiangxi Zichen Technology Co., Ltd.	Graphite	Compound graphite	--	Tested with appliance
INR18650-29E					
Cell	Hengdian Group DMEGC Magnetics Co., Ltd.	INR18650-29E	3,7 V, 2900 mAh	IEC 62133-2: 2017 EN 62133-2:2017	Tested with appliance
- Electrolyte	Shenzhen Capchem Technology Co., Ltd.	--	EC/EMC/DMC/LiPF6	--	Tested with appliance
- Separator	Cangzhou Mingzhu Plastic Co., Ltd.	16 um*61mm	Material: PE, Coating Film Shutdown temperature: 138±10°C	--	Tested with appliance
- Positive material	XingXiang TianLi Energy Co., Ltd.	NCM	NCM	--	Tested with appliance
- Negative material	Jiangxi Zichen Technology Co., Ltd.	Graphite	Compound graphite	--	Tested with appliance
Supplementary information: [1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
INR18650-29EA (#1)	4,2	1,45	4,194	P
INR18650-29EA (#2)	4,2	1,45	4,192	P
INR18650-29EA (#3)	4,2	1,45	4,194	P
INR18650-29EA (#4)	4,2	1,45	4,195	P
INR18650-29EA (#5)	4,2	1,45	4,195	P

Supplementary information:
-No fire, no explosion
-No leakage

7.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Sample no.	**Recommended charging voltage Vc (Vdc)**	**Recommended charging current I_{rec} (A)**	**OCV before test (Vdc)**	**Results**
INR18650-29E (#1)	4,2	1,45	4,191	P
INR18650-29E (#2)	4,2	1,45	4,193	P
INR18650-29E (#3)	4,2	1,45	4,192	P
INR18650-29E (#4)	4,2	1,45	4,191	P
INR18650-29E (#5)	4,2	1,45	4,191	P

Supplementary information:
-No fire, no explosion
-No leakage

7.2.2	TABLE: Case stress at high ambient temperature	N/A
Sample no.	**OCV at start of test (Vdc)**	**Results**
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Supplementary information:
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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Results**
Samples charged at charging temperature upper limit [1)]					
INR18650-29EA (#6)	55,0	4,175	80	55,1	P
INR18650-29EA (#7)	55,0	4,175	80	59,9	P
INR18650-29EA (#8)	55,0	4,182	80	54,7	P
INR18650-29EA (#9)	55,0	4,174	80	61,8	P
INR18650-29EA (#10)	55,0	4,175	80	58,4	P
Samples charged at charging temperature lower limit [2)]					
INR18650-29EA (#11)	55,0	4,116	80	64,6	P
INR18650-29EA (#12)	55,0	4,114	80	57,1	P
INR18650-29EA (#13)	55,0	4,114	80	59,7	P
INR18650-29EA (#14)	55,0	4,116	80	60,6	P
INR18650-29EA (#15)	55,0	4,116	80	64,1	P

Supplementary information:

-No fire, no explosion

[1)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[2)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.1	TABLE: External short-circuit (cell)				P
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Results**
Samples charged at charging temperature upper limit [1)]					
INR18650-29E (#6)	55,0	4,175	80	58,3	P
INR18650-29E (#7)	55,0	4,174	80	57,3	P
INR18650-29E (#8)	55,0	4,176	80	54,1	P
INR18650-29E (#9)	55,0	4,174	80	57,4	P
INR18650-29E (#10)	55,0	4,176	80	56,8	P
Samples charged at charging temperature lower limit [2)]					
INR18650-29E (#11)	55,0	4,113	80	54,9	P
INR18650-29E (#12)	55,0	4,118	80	57,3	P
INR18650-29E (#13)	55,0	4,117	80	56,4	P
INR18650-29E (#14)	55,0	4,114	80	56,1	P
INR18650-29E (#15)	55,0	4,113	80	55,9	P

Supplementary information:

-No fire, no explosion

[1)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[2)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

7.3.2	TABLE: External short-circuit battery					N/A
Sample no.	**Ambient T (°C)**	**OCV before test (Vdc)**	**Resistance of circuit (mΩ)**	**Maximum case temperature rise ΔT (K)**	**Component single fault condition**	**Results**
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Supplementary information:

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.5	TABLE: Crush (cells)			P
Sample no.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit [1)]				
INR18650-29EA (#29)	4,175	4,173	13	P
INR18650-29EA (#30)	4,178	4,175	13	P
INR18650-29EA (#31)	4,182	4,173	13	P
INR18650-29EA (#32)	4,175	4,105	13	P
INR18650-29EA (#33)	4,174	4,169	13	P
Samples charged at charging temperature lower limit [2)]				
INR18650-29EA (#34)	4,114	4,109	13	P
INR18650-29EA (#35)	4,114	4,109	13	P
INR18650-29EA (#36)	4,113	4,056	13	P
INR18650-29EA (#37)	4,115	4,111	13	P
INR18650-29EA (#38)	4,115	4,106	13	P

Supplementary information:

-No fire, no explosion

[1)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[2)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.5	TABLE: Crush (cells)			P
Sample no.	**OCV before test (Vdc)**	**OCV at removal of crushing force (Vdc)**	**Maximum force applied to the cell during crush (kN)**	**Results**
Samples charged at charging temperature upper limit [1)]				
INR18650-29E (#29)	4,174	4,171	13	P
INR18650-29E (#30)	4,175	4,173	13	P
INR18650-29E (#31)	4,175	4,163	13	P
INR18650-29E (#32)	4,175	4,153	13	P
INR18650-29E (#33)	4,176	4,153	13	P
Samples charged at charging temperature lower limit [2)]				
INR18650-29E (#34)	4,113	4,103	13	P
INR18650-29E (#35)	4,117	4,106	13	P
INR18650-29E (#36)	4,110	4,106	13	P
INR18650-29E (#37)	4,114	4,110	13	P
INR18650-29E (#38)	4,111	4,104	13	P

Supplementary information:

-No fire, no explosion

[1)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[2)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

7.3.6	TABLE: Over-charging of battery			N/A
Constant charging current (A) ..... :	--			—
Supply voltage (Vdc) ..... :	--			—
Sample no.	**OCV before charging (Vdc)**	**Total charging time (minute)**	**Maximum outer case temperature (°C)**	**Results**
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Supplementary information:

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (A)**	**Lower limit discharge voltage (Vdc)**	**Results**
INR18650-29EA (#39)	3,093	2,9	2,7	P
INR18650-29EA (#40)	3,104	2,9	2,7	P
INR18650-29EA (#41)	3,111	2,9	2,7	P
INR18650-29EA (#42)	3,108	2,9	2,7	P
INR18650-29EA (#43)	3,094	2,9	2,7	P
Supplementary information: -No fire, no explosion				

7.3.7	TABLE: Forced discharge (cells)			P
Sample no.	**OCV before application of reverse charge (Vdc)**	**Measured reverse charge I_t (A)**	**Lower limit discharge voltage (Vdc)**	**Results**
INR18650-29E (#39)	3,112	2,9	2,7	P
INR18650-29E (#40)	3,105	2,9	2,7	P
INR18650-29E (#41)	3,110	2,9	2,7	P
INR18650-29E (#42)	3,102	2,9	2,7	P
INR18650-29E (#43)	3,107	2,9	2,7	P
Supplementary information: -No fire, no explosion				

7.3.8.1	TABLE: Vibration				N/A
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
--	--	--	--	--	--
Supplementary information: --					

7.3.8.2	TABLE: Mechanical shock				N/A
Sample no.	**OCV before test (Vdc)**	**OCV after test (Vdc)**	**Mass before test (g)**	**Mass after test (g)**	**Results**
--	--	--	--	--	--
Supplementary information: --					

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.9	TABLE: Forced internal short circuit (cells)				P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit [2)]					
INR18650-29EA (#44)	50,0	4,168	1	800,0	P
INR18650-29EA (#45)	50,0	4,167	1	800,0	P
INR18650-29EA (#46)	50,0	4,164	1	800,0	P
INR18650-29EA (#47)	50,0	4,168	2	800,0	P
INR18650-29EA (#48)	50,0	4,163	2	800,0	P
Samples charged at charging temperature lower limit [3)]					
INR18650-29EA (#49)	0,0	4,107	1	800,0	P
INR18650-29EA (#50)	0,0	4,113	1	800,0	P
INR18650-29EA (#51)	0,0	4,103	1	800,0	P
INR18650-29EA (#52)	0,0	4,104	2	800,0	P
INR18650-29EA (#53)	0,0	4,106	2	800,0	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.

[2)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[3)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

- No fire

Remark: The pressure reaches 800 N

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.9	TABLE: Forced internal short circuit (cells)				P
Sample no.	**Chamber ambient T (°C)**	**OCV before test (Vdc)**	**Particle location [1)]**	**Maximum applied pressure (N)**	**Results**
Samples charged at charging temperature upper limit [2)]					
INR18650-29E (#44)	50,0	4,168	1	800,0	P
INR18650-29E (#45)	50,0	4,168	1	800,0	P
INR18650-29E (#46)	50,0	4,166	1	800,0	P
INR18650-29E (#47)	50,0	4,164	2	800,0	P
INR18650-29E (#48)	50,0	4,167	2	800,0	P
Samples charged at charging temperature lower limit [3)]					
INR18650-29E (#49)	0,0	4,113	1	800,0	P
INR18650-29E (#50)	0,0	4,110	1	800,0	P
INR18650-29E (#51)	0,0	4,116	1	800,0	P
INR18650-29E (#52)	0,0	4,104	2	800,0	P
INR18650-29E (#53)	0,0	4,108	2	800,0	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.

[2)] Cells charged at 50°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA;

[3)] Cells charged at 0°C by using 4,25 V and 5,8 A until the charging current reduced to 145 mA.

- No fire

Remark: The pressure reaches 800 N

D.2	TABLE: Internal AC resistance for coin cells			N/A
Sample no.	**Ambient T (°C)**	**Store time (h)**	**Resistance Rac (Ω)**	**Results [1)]**
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Supplementary information:

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---End report---

Attachment 1 Photo documentation

INR18650-29EA

Attachment 1 Photo documentation

INR18650-29E

- - - End of Attachment 1 - - -

Attachment 2 Information for safety

Recommendations to equipment manufacturers and battery assemblers

The following represents a typical, but non-exhaustive, list of good advice to be provided by the manufacturer of secondary cells and batteries to equipment manufacturers and battery assemblers.

a) Do not dismantle, open or shred cells. Batteries should be dismantled only by trained personnel. Multi-cell battery cases should be designed so that they can be opened only with the aid of a tool.

b) Compartments should be designed to prevent easy access to the batteries by young children.

c) Do not short-circuit a cell or battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by conductive materials.

d) Do not remove a cell or battery from its original packaging until required for use.

e) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.

f) Do not subject cells or batteries to mechanical shock.

g) In the event of a cell leaking, do not allow the liquid to come into contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.

h) Equipment should be designed to prohibit the incorrect insertion of cells or batteries and should have clear polarity marks. Always observe the polarity marks on the cell, battery and equipment and ensure correct use.

i) Do not mix cells of different manufacture, capacity, size or type within a battery.

j) Seek medical advice immediately if a cell or battery has been swallowed.

k) Consult the cell or battery manufacturer on the maximum number of cells which may be assembled in a battery and on the safest way in which cells may be connected.

l) A dedicated charger should be provided for each equipment. Complete charging instructions should be provided for all secondary cells and batteries offered for sale.

m) Keep cells and batteries clean and dry.

n) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.

o) Secondary cells and batteries need to be charged before use. Always refer to the cell or battery manufacturer's instructions and use the correct charging procedure.

p) Do not maintain secondary cells and batteries on charge when not in use.

q) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.

r) Retain the original cell and battery literature for future reference.

s) When disposing of secondary cells or batteries, keep cells or batteries of different electrochemical systems separate from each other.

- - - End of Attachment 2 - - -

Attachment 3 Packaging

- - - End of Attachment 3 - - -

Attachment 4 Specifications

Specification

Item		INR18650-29EA	INR18650-29E
Rated Capacity		2900 mAh	2900 mAh
Rated Voltage		3,6 V	3,7 V
Discharge Cut-off Voltage		2,7 V	2,7 V
Max. Charge Voltage		4,25 V	4,25 V
Standard Charge current		1450 mA	1450 mA
Standard Charge Voltage		4,2 V	4,2 V
End of charging current		145 mA	145 mA
Max. Charge Current		5800 mA	5800 mA
Max. Discharge Current		10 A	10 A
Operating Temperature	Charge	0°C~50°C	0°C~50°C
	Discharge	-20°C~60°C	-20°C~60°C

- - - End of Attachment 4 - - -

Attachment 5 ISO9001 certificate

Certificate of
Management System Certification

This is to certify the quality management system of

HENGDIAN GROUP DMEGC MAGNETICS CO., LTD.

Unified Social Credit Code:91330000712560751D

REGISTRATION ADDRESS: HENGDIAN INDUSTRIAL PARK, DONGYANG CITY, ZHEJIA CITY, HEJIANG PROVINCE P.C.:322118

MANAGEMENT/PRODUCTION ADDRESS: B2 & B1 BUILDING, DONGCI PV PARK, HENGDIAN TOWN, DONGYANG CITY, JINHUA CITY, ZHEJIANG PROVINCE P.C.:322118

Is in conformity with

ISO 9001:2015

This certificate covers the following area

DESIGN AND MANUFACTURE OF LITHIUM ION BATTERY SYSTEM AND LITHIUM ION BATTERY

Initial Certification Date: AUG.02,2016 Issue Date: From JUL.29,2019

Validity Period: From JUL.29,2019 To JUL.28,2022

Certificate No.: U919119Q31524R1M Signer: 韩海华

9191

Certified client shall receive at least one surveillance audit every year within the validity period, the certificate shall only be valid when used in conjunction with the Notice Letter of Annual Surveillance Certification Decision. Note: The management system certification audit report and surveillance conclusion notice can obtain from the HSQC Certified Clients Relationship Management System (website: vip.hsqc.cn) Information on this certificate could be verified on the official website of Certification and Accreditation Administration of the People's Republic of China (www.cnca.gov.cn) and www.hsqc.cn

Beijing Daluhangxing Quality Certification Center Co., Ltd.

Address: No. Jia 12, Yuquan road, Haidian district, Beijing, P.R. China P.C.: 100143

- - - End of Attachment 5 - - -