

Test Report No:

Page 1 of XX

Issue Date: DD/MM/YYYY

Manufacturer:	Applicant's Name Applicant's address		
Test item:	(Secondary Battery)		
Identification:	Serial No.:	----	
Receipt No.:	----	Date of receipt:	
Testing laboratory and its address:			
Test specification:	IS 16046 (Part 1):2018 / IEC 62133-1:2017		
Test Result:	The test item passed / failed the test specification(s).		
Other Aspects:	Brief description or additional details could be given by the labs here.		
This test report relates to the test sample submitted and list of documents attached.			

Tested by:	Approved by / Authorized Signatory:	Issued by:
(Name / Designation)	(Name / Designation)	(Name / Designation)
Date:	Date:	Date:

TEST REPORT IS 16046 (Part 1):2018 / IEC 62133-1:2017 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 1: Nickel systems	
Report Reference No. : Date of issue : (see cover page) Total number of pages : (see cover page)	
Testing Laboratory : Address :	
Manufacturer's name : Factory Name Address : Factory address	
Test specification: Standard : IS 16046 (Part 1):2018 / IEC 62133-1:2017 Test procedure : BIS Compliance Report Non-standard test method..... : N/A	
Test Report Form No. : BIS_BAT/SCAB_IS16046(PART1)_V1.0 Test Report Form(s) Originator : Bureau of Indian Standards Master TRF : 10.01.2019	
Test item description : (Secondary Cell) Trade Mark..... : Model/Type reference : Ratings : Other Documents submitted : Please refer to Table – List of Attachments at Page No. xx	

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(Name / Designation)	(Name / Designation)	(Name / Designation)
Date:	Date:	Date:

Dated: DD/MM/YYYY

Description	Measurement/ testing	Total No. of tests	Total no. of applicable tests/ Req.	No. of tests/ Req. passed	Page No.
General Requirements	Parameter measurement tolerances				
General safety considerations	Insulation and wiring				
General safety considerations	Venting				
General safety considerations	Temperature/voltage/Current management				
General safety considerations	Terminal contacts				
General safety considerations	Assembly of cells into batteries				
General safety considerations	Quality plan				
Type test and sample size	Type test conditions				
Specific requirements and tests	Charging procedure for test purposes				
Specific requirements and tests	Intended use				
Specific requirements and tests	Reasonably foreseeable misuse				
Information for safety	Information for safety				
Marking Requirements	Marking Requirements				
Packaging	Packaging				

Certificate: It is certified that the above tests were performed and found to be passing/Failing in the requirement tested.

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(Approving Authority

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

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment – 1		
Attachment – 2		
Attachment – 3		
Attachment – 4		
Attachment – 5		
Attachment – 6		

Copy of Marking Plate:

Test item particulars..... :	
Classification of installation and use :	
Supply connection..... :	
Recommend charging method declared by the manufacturer..... :	
Discharge current (0,2 I_t A) :	
Specified final voltage..... :	
Chemistry :	Nickel systems
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.....:	
Date (s) of performance of tests.....:	
General remarks:	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>"(See Enclosure #)" refers to additional information appended to the report.</p> <p>"(See appended table)" refers to a table appended to the report.</p>	
Laboratory Conditions	
Ambient Temperature..... :	
Ambient Humidity..... :	

General product information:

1) Application details / Description of the product:

Max. specified ambient temperature (°C)..... :

Laser classification : < delete this line, if not applicable >

2) Differences between the models:

(N/A, one single model)

<OR>

< describe the constructional differences in such general terms, that the informed reader can still make a rough evaluation of their safety relevance >

Model No. tested with-in the family series . :

3) Options:

The following (optional) accessories are included in this test report:

<OR>

The equipment was tested without any optional accessory installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory that might affect safety in the meaning of this standard.

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Clause	Requirement + Test	Result - Remark	Verdict
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4	Parameter measurement tolerances		
	Parameter measurement tolerances		

Total number of Requirements to be observed / inspected =

Total No of applicable Requirement =

No of Requirements for which the sample passed:

Total number of tests to be conducted :

Total No of applicable Tests =

No. of tests for which the sample passed:

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5	General safety considerations		
5.1	General		
5.2	Insulation and wiring		
	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		
	Insulation resistance (MΩ)..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		

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5.3	Venting		
	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		
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		

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Clause	Requirement + Test	Result - Remark	Verdict
5.4	Temperature, voltage and current management		
	Batteries are designed such that abnormal temperature-rise conditions are prevented		
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		
	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		

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Clause	Requirement + Test	Result - Remark	Verdict
5.5	Terminal contacts		
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		
	Terminal contacts are arranged to minimize the risk of short circuits		

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Clause	Requirement + Test	Result - Remark	Verdict
5.6	Assembly of cells into batteries		
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		
	Battery has some type of safety device or feature for charging.		
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer /designer may ensure proper design and assembly		
	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		
	Protective circuit components are added as appropriate and consideration given to the end-device application		
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this document		

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Clause	Requirement + Test	Result - Remark	Verdict
5.7	Quality plan		
	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		

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6	Type test and sample size		
	Tests were made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old		
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.		

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7	Specific requirements and tests		
7.1	Charging procedure for test purposes		
<p>Total number of Requirements to be observed / inspected =</p> <p>Total No of applicable Requirement =</p> <p>No of Requirements for which the sample passed:</p> <p>Total number of tests to be conducted :</p> <p>Total No of applicable Tests =</p> <p>No. of tests for which the sample passed:</p> <p>Certificate: It is certified that the above tests were performed and found to be passing/failing in the requirement tested.</p> <p>.....</p> <p>(Approving Authority)</p>			

Clause	Requirement + Test	Result - Remark	Verdict
7.2	Intended use		
7.2.1	Continuous low-rate charging (cells)		
	Results: No fire. No explosion	(See Table 7.2.1)	
7.2.2	Vibration		
	Results: No fire. No explosion. No leakage	(See Table 7.2.2)	
7.2.3	Case stress at high ambient temperature(batteries)		
	Oven temperature (°C) :		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		
7.2.4	Temperature cycling		
	Results: No fire. No explosion. No leakage.		

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Clause	Requirement + Test	Result - Remark	Verdict
7.3	Reasonably foreseeable misuse		
7.3.1	Incorrect installation (cells)		
	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		
	- A stabilized dc power supply.		
	Results: No fire. No explosion.....:	(See Table 7.3.1)	
7.3.2	External short circuit		
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		
	- The case temperature declined by 20% of the maximum temperature rise		
	Results: No fire. No explosion.....:	(See Table 7.3.2)	
7.3.3	Free fall		
	Results: No fire. No explosion.		
7.3.4	Mechanical shock (crash hazard)		
	Results: No fire. No explosion. No leakage.		
7.3.5	Thermal abuse (cells)		
	Oven temperature (°C).....:		—
	Results: No fire. No explosion.		
7.3.6	Crushing of cells		
	The crushing force was released upon: - The maximum force of 13 kN ± 0.78 kN has been applied; or		
	- An abrupt voltage drop of one-third of the original voltage has been obtained		
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		
	Results: No fire. No explosion.....:	(See Table 7.3.6)	
7.3.7	Low pressure (cells)		
	Chamber pressure (kPa).....:		—
	Results: No fire. No explosion. No leakage.		
7.3.8	Overcharge		
	Results: No fire. No explosion.....:	(See Table 7.3.8)	
7.3.9	Forced discharge		

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Clause	Requirement + Test	Result - Remark	Verdict
	Results: No fire. No explosion.....:	(See Table 7.3.9)	

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8	Information for safety		
8.1	General		
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.		
	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.		
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user.....:		
	Guidance is provided in IEC TR 62188 on the design are provided for information in Annex A and Annex B.		
8.2	Small cell and battery safety information		
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		
	-Keep small cells and batteries which are considered swallowable out of the reach of children.		
	-Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2h of ingestion.		
	-In case of ingestion of a cell or battery, seek medical assistance promptly.		

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9	Marking		
9.1	Cell marking		
	Cells marked as specified in the applicable cell standards: IEC 61951-1 or IEC 61951-2.		
	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.		
	However, cell marking can be indicated with the battery, the instructions and/or the specifications.		
9.2	Battery marking		
	Batteries marked as specified in the applicable cell standards: IEC 61951-1 or IEC 61951-2.		
	Batteries marked with an appropriate caution statement.		
	Terminals have clear polarity marking on the external surface of the battery.		
	Batteries with keyed external connector need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		
9.3	Caution for ingestion of small cells and batteries		
	Small cells and batteries determined to be small are including a caution statement regarding the hazards of ingestion in accordance with 8.2.		
	Small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion are given on the immediate package.		
9.4	Other information		
	Storage and disposal instructions marked on or supplied with the battery.		
	Recommended charging instructions marked on or supplied with the battery.		

Total number of Requirements to be observed / inspected =

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No of Requirements for which the sample passed:

Total number of tests to be conducted :

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10	Packaging		
	Packaging for button cells are not be small enough to fit within the limits of the ingestion gauge of Figure 2		
	Annex C for information regarding packaging		

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Annex A (informative)	Recommendations to equipment manufacturers and battery assemblers	
Annex B (informative)	Recommendations to the end-users	
Annex C (informative)	Packaging	

TABLE: Critical components information					
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity ¹⁾
Insulation					
- Insulation tape					
- Insulation sheet					
Internal wiring					
Encapsulation					
- Enclosure					
- Jacket					
Temperature/curr ent management devices					
- CID					
- Fuse					
- PTC					
- Control IC					
- FET					
Terminal contacts					
Terminal insulation					
Cells					
- Electrolyte					
- Separator					
- Anode					
- Cathode					
Supplementary information:					

Dated: DD/MM/YYYY

7.2.1	TABLE: Continuous low rate charge (cells)					
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: <ul style="list-style-type: none"> - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain) 						

7.2.2	TABLE: Vibration		
Model	OCV at start of test, (Vdc)	Results	
Supplementary information: <ul style="list-style-type: none"> - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain) 			

Dated: DD/MM/YYYY

7.3.1	TABLE: Incorrect installation (cells)		
Model	OCV of reversed cell, (Vdc)	Results	
Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)			

7.3.2	TABLE: External short circuit					
Model	Ambient (at 20°C ± 5°C or 55°C ± 5°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT, (°C)	Results	
Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)						

Dated: DD/MM/YYYY

7.3.6	TABLE: Crush			
Model	OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Results	
Supplementary information: <ul style="list-style-type: none">- No fire or explosion- No leakage- Leakage- Fire- Explosion- Bulge- Others (please explain)				

7.3.8	TABLE: Overcharge				
Model	OCV prior to charging, (Vdc)	Maximum charge current, (A)	Time for charging, (hours)	Results	
Supplementary information: <ul style="list-style-type: none">- No fire or explosion- No leakage- Leakage- Fire- Explosion- Bulge- Others (please explain)					

Dated: DD/MM/YYYY

7.3.9	TABLE: Forced discharge (cells)				
Model	OCV before application of reverse charge, (Vdc)	Measured reverse charge I_t, (A)	Time for reversed charge, (minutes)	Results	
Supplementary information: <ul style="list-style-type: none">- No fire or explosion- No leakage- Leakage- Fire- Explosion- Bulge- Others (please explain)					

ATTACHMENT**Enclosures**

Supplement Id	Description
01	
02	
03	
04	
05	
06	

