

Test Report

No.: SZXEC23003173101

Date: Dec 27, 2023

Page 1 of 4

Client Name:

Client Address:

Sample Name: Cell

Model No.: IMR18650-1800mAh

Client Ref. Information: Series model:14500-300/14500-400/14500-500/14500-600/
18650-800/18650-1200/18650-1300/18650-1500/18650-
2000/18650-2200/18650-2500/18650-2600/18650-3000

Sample Type: Portable non-zinc-air button cell

The above sample(s) and information were provided by the client.

SGS Job No.: SZP23-032628

Sample Receiving Date: Dec 15, 2023

Testing Period: Dec 15, 2023 ~ Dec 22, 2023

Test Requested: Select test(s) as requested by the client.

Test Method(s): Please refer to next page(s).

Test Result(s): Please refer to next page(s).

Test Requirement	Conclusion
Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and waste batteries	Pass

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Ford Shi
Approved Signatory

scan to see the report



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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Testing and Calibration Laboratory

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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A	SZX23-0031731-0001	"Cell"

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and waste batteries

Test Method: SGS In House Method, analysis was performed by ICP-OES or AAS or Hg-analyzer.

Test Item(s)	Limit	Unit(s)	MDL	A
Lead(Pb)	0.01	%	0.0010	ND
Cadmium(Cd)	0.002	%	0.0010	ND
Mercury(Hg)	0.0005	%	0.0001	ND
Conclusion				Pass

Notes:

Column 1 Designation of the substance or group of substances	Column 2 Conditions of restriction
1. Mercury CAS No 7439-97-6 EC No 231-106-7 and its compounds	Batteries, whether or not incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0,0005 % of mercury (expressed as mercury metal) by weight
2. Cadmium CAS No 7440-43-9 EC No 231-152-8 and its compounds	Portable batteries, whether or not incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0,002 % of cadmium (expressed as cadmium metal) by weight
3. Lead CAS No 7439-92-1 EC No 231-100-4 and its compounds	1. From 18 August 2024, portable batteries, whether or not incorporated into appliances, shall not contain more than 0,01 % of lead (expressed as lead metal) by weight. 2. The restriction set out in point 1 shall not apply to portable zinc-air button cells until 18 August 2028.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019.



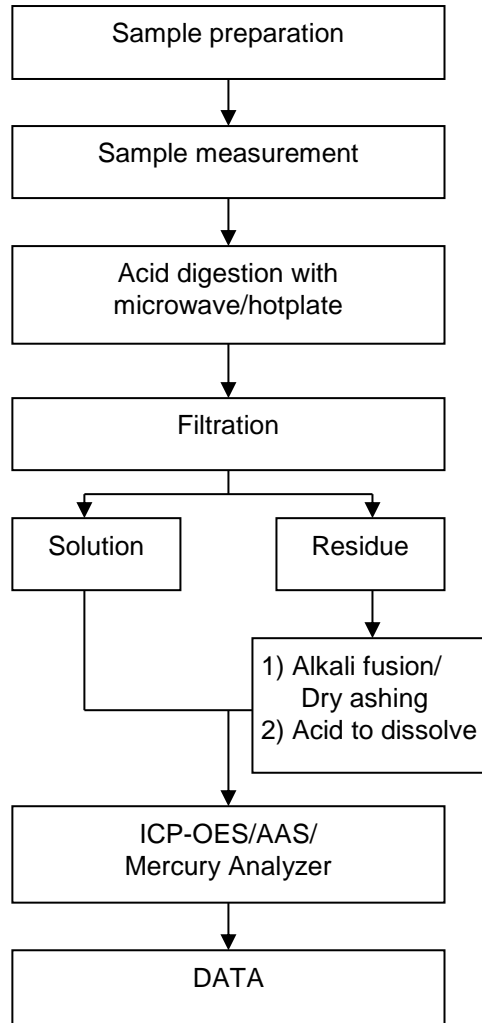
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Shenzhen Branch Testing Center-Chemical Laboratory

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Battery Testing Flow Chart



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Test Report

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Sample Photo:



SGS authenticate the photo on original report only

*** End of Report ***



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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..... : CN22QTEM 002

Date of issue..... : 2023-08-16

Total number of pages : 6 pages

Name of Testing Laboratory preparing the Report : Guangzhou MCM Certification & Testing Co., Ltd.

Applicant's name :

Address..... :

Test specification:

Standard : IEC 62133-2:2017, IEC 62133-2:2017/AMD1:2021

Test procedure : CB Scheme

Non-standard test method : N/A

TRF template used..... : IECEE OD-2020-F1:2021, Ed.1.4

Test Report Form No. : IEC62133_2C

Test Report Form(s) Originator : DEKRA Certification B.V.

Master TRF : Dated 2022-07-01

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

General disclaimer:

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

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Test item description	Cylindrical Lithium-ion Rechargeable Cell	
Trade Mark(s).....	N/A	
Manufacturer.....	Same as applicant	
Model/Type reference	IMR18650-3000mAh; IMR18650-2600mAh; IMR18650-2500mAh; IMR18650-2200mAh; IMR18650-2000mAh; IMR18650-1800mAh; IMR18650-1500mAh; IMR18650-1200mAh; IMR18650-800mAh	
Ratings	3.7V, 3000mAh, 11.1Wh; 3.7V, 2600mAh, 9.62Wh; 3.7V, 2500mAh, 9.25Wh; 3.7V, 2200mAh, 8.14Wh; 3.7V, 2000mAh, 7.4Wh; 3.7V, 1800mAh, 6.66Wh; 3.7V, 1500mAh, 5.55Wh; 3.7V, 1200mAh, 4.44Wh; 3.7V, 800mAh, 2.96Wh	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Guangzhou MCM Certification & Testing Co., Ltd.
	Testing location/ address	Room 101 to 116 & 216, Building 2 (Office Building and Workshop)No. 45 Zhong Er Section of Shiguang Road, Zhongcun Street, Panyu District, Guangzhou City, Guangdong Province, China
	Tested by (name, function, signature)	Lena Lee (Engineer) <i>Lena Lee</i>
	Approved by (name, function, signature) ..	Liang Hongcheng (Reviewer) <i>Liang Hongcheng</i>
<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: National Differences (4 pages)
See original report CN22QTEM 001.

Summary of testing:

Tests performed (name of test and test clause):

N/A

Testing location:

N/A

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

KR

KR=Republic of Korea

The product fulfils the requirements of EN 62133-2:2017, EN 62133-2:2017/A1:2021.

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: N/A (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.

See original report CN22QTEM 001.

Test item particulars:	
Classification of installation and use:	To be defined in final product
Supply Connection	DC terminal
Recommend charging method declared by the manufacturer	Charging the cell with 0.2C constant current until 4.2V, then constant voltage until charge current reduces to 0.02C at ambient 20°C±5°C.
Discharge current (0,2 It A)	3000mAh: 600mA; 2600mAh: 520mA; 2500mAh: 500mA; 2200mAh: 440mA; 2000mAh: 400mA; 1800mAh: 360mA; 1500mAh: 300mA; 1200mAh: 240mA; 800mAh: 160mA
Specified final voltage:	3.0V
Upper limit charging voltage per cell:	4.2V
Maximum charging current	3000mAh: 1500mA; 2600mAh: 1300mA; 2500mAh: 1250mA; 2200mAh: 1100mA; 2000mAh: 1000mA; 1800mAh: 900mA; 1500mAh: 750mA; 1200mAh: 600mA; 800mAh: 400mA
Charging temperature upper limit	45°C
Charging temperature lower limit:	0°C
Polymer cell electrolyte type:	<input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer <input checked="" type="checkbox"/> 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	N/A
Date (s) of performance of tests	N/A
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.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC62 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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:

This test Report shall be read in conjunction with the original report CN22QTEM 001.

Description of change(s):

1. Corrected the error about energy density for cell (IMR18650-1200mAh) from "2553.55Wh/L" to "**253.55Wh/L**", See Attachment 1: National Differences.
2. Updated National Differences of Republic of Korea. See Attachment 1.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments	Result
1, 2	N/A	No safety impact, no further testing considered as necessary.	P

History of amendments and modifications:

Ref. No. CN22QTEM 001, dated 2023-07-14 (original test report)

Ref. No. CN22QTEM 002, dated 2023-08-16 (1st amendment)

-- End of Report --

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 62133-2 (Republic of Korea) NATIONAL DIFFERENCES (Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems)			
Differences according to : National standard KC62133-2(2020-07)			
TRF template used:..... : IECEE OD-2020-F3:2022, Ed. 1.2			
Attachment Form No. : KR_ND_IEC62133_2C			
Attachment Originator : KTR			
Master Attachment..... : 2023-08-02			
Copyright © 2022 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
	National Differences		P
7.3.6	Over-charging of battery		N/A
(Revision)	<p>[Add the bolded text]</p> <p>b) Test</p> <p>The test shall be carried out in an ambient temperature of 20 °C ± 5 °C. Each test battery shall be discharged at a constant current of 0,2 k A, to a final discharge voltage specified by the manufacturer. Sample batteries shall then be charged at a constant current of 2,0 k A, using a supply voltage which is:</p> <ul style="list-style-type: none"> • 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 • 1,2 times the upper limit charging voltage presented in Table A.1 per cell for series connected multi-cell batteries, and • sufficient to maintain a current of 2,0 k A throughout the duration of the test or until the supply voltage is reached. <p><u>• In case the charging voltage specified by the manufacturer is higher than the overcharge test voltage, the maximum charging voltage specified by manufacturer should be applied with 2,0 k A₂</u></p> <p>(e.g., quick charging power bank, etc.)</p>	Cell only.	N/A

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>[Replace to the following statement]</p> <p>c) Acceptance criteria</p> <p>Filling beyond the manufacturer's specified limits should not result in ignition or explosion</p>		N/A
Annex G	Definition for shape and materials of outer case for cell		—
<i>(Addition)</i>	<p>G.1 General</p> <p>Annex G provides definitions for shape and materials of outer case for cell</p> <p>G.2 Shape of outer case for cell</p> <p>G 2.1 Cylindrical cell</p> <p>Cell with a cylindrical shape in which the overall height is equal to or greater than diameter.</p> <p>G 2.2 Prismatic cell</p> <p>Cell having the shape of a parallelepiped whose faces are rectangular</p> <p>G.3 Materials of outer case for cell</p> <p>G.3.1 Soft case</p> <p>Non-metallic outer case or container for cell</p> <p>G.3.2 Hard case</p> <p>Metallic outer case or container for cell.</p>	<p>(Shape of outer cases)</p> <p><input checked="" type="checkbox"/> Cylindrical</p> <p><input type="checkbox"/> Prismatic</p> <p>(Materials of outer cases)</p> <p><input checked="" type="checkbox"/> Hard</p> <p><input type="checkbox"/> Soft</p>	—
Annex H	Calculation method of the volumetric energy density for cell		—

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
(Addition)	<p>Annex H provide a calculation method of the volumetric energy density for cell in use of smart phone, tablet, notebook.</p> <p>H.1 General</p> <p>Unless otherwise stated in the Annex E, the dimensions for calculation are based on these for cell before shipment and the volumetric energy density shall be calculated with a maximum values specified by manufacturer. If the specification for cell can't be provided a dimension for calculation, the manufacturer's other documentation shall be provided to demonstrate compliance for its calculation.</p>	<p>IMR18650-3000mAh: 633.87Wh/L</p> <p>IMR18650-2600mAh: 549.35Wh/L</p> <p>IMR18650-2500mAh: 528.22Wh/L</p> <p>IMR18650-2200mAh: 464.84Wh/L</p> <p>IMR18650-2000mAh: 422.58Wh/L</p> <p>IMR18650-1800mAh: 380.32Wh/L</p> <p>IMR18650-1500mAh: 316.93Wh/L</p> <p>IMR18650-1200mAh: 253.55Wh/L</p> <p>IMR18650-800mAh: 169.03Wh/L</p>	—

ATTACHMENT to IEC62133_2C			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>H.2 Calculation Method</p> <p>L : Length (max.) of cell (including terrace) W : Width (max.) of cell T : Thickness (max.) when shipping charge (For reference, Please Exclude the dimension of any tape that is attached to cell)</p> $\text{Volumetric energy density (Wh/L)} = \frac{\text{Nominal voltage (V)} \times \text{Rated capacity (Ah)}}{\text{Length (L)} \times \text{Width (W)} \times \text{Thickness (T)}}$ <p>[H.1 – Prismatic cell using soft case]</p> <p>L : Length (max.) of cell W : Width (max.) of cell T : Thickness when shipping charge (For reference, Please Exclude the dimension of any tape that is attached to cell)</p> $\text{Volumetric energy density (Wh/L)} = \frac{\text{Nominal voltage (V)} \times \text{Rated capacity (Ah)}}{\text{Length (L)} \times \text{Width (W)} \times \text{Thickness (T)}}$ <p>[H.2 – Prismatic cell using hard case]</p> <p>D : Diameter (max.) of cell L : Length (max.) of cell (According to shape of cell at shipping, The dimension of tube for cell may be included in overall dimension of cell)</p> $\text{Volumetric energy density (Wh/L)} = \frac{\text{Nominal voltage (V)} \times \text{Rated capacity (Ah)}}{3.14159 \times \frac{\text{Diameter (D)}^2}{4} \times \text{Length(L)}}$ <p>[H.3 – Cylindrical cell using hard case]</p>		