

## Test Report

Report No. : TCT210324C004

Date : Mar. 29, 2021

Page No.: 1 of 3

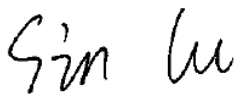
**Applicant:**

**Address:**

**The following sample was submitted and identified by/on behalf of the client as:**

Sample Name: Rechargeable lithium polymer battery  
Model No.: Y 801727  
Trade Mark: Y  
Sample Received Date: 2021.03.24  
Testing Period: 2021.03.24—2021.03.29  
Test Requested: Accordance with Directive 2006/66/EC, to determine the Lead (Pb), Cadmium (Cd), Mercury (Hg) contents of the submitted sample(s).  
Test Method: Please refer to the following page(s).  
Test Result(s): Please refer to the following page(s).  
Conclusion: Test results of submitted sample(s) comply with the limit set by Directive 2006/66/EC and its amendment 2013/56/EU.

Checked by



Sin Lu

Signed for and on behalf of TCT



Noel Yin

Technical Manager



# Test Report

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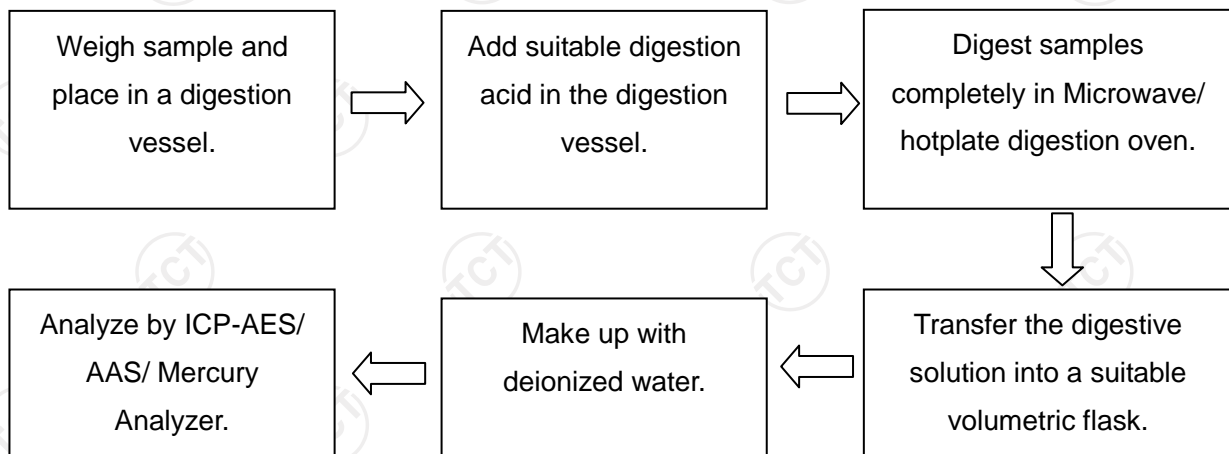
## Test Results:

### Lead, Cadmium and Mercury Content(s)

Test Items	Test Method	Unit	Test Results	MDL	Labelling Requirement <sup>#</sup>	Permissible Limit
Lead (Pb)	With reference to GB/T 20155-2018, Analysis was performed by ICP-OES	%	N.D.	0.0010	> 0.004	--
Cadmium (Cd)			N.D.	0.0010	> 0.002	0.002 <sup>##</sup>
Mercury (Hg)			N.D.	0.0001	> 0.0005	0.0005

- Note :
- MDL = Method Detection Limit
  - N.D. = Not detected, less than MDL.
  - <sup>#</sup> = According to the article 21.3, batteries, accumulators and button cells containing more than 0,0005 % mercury, more than 0,002 % cadmium or more than 0,004 % lead, shall be marked with the chemical symbol for the metal concerned: Hg, Cd or Pb.
  - <sup>##</sup> = Not apply to portable batteries and accumulators intended for use in:
    - (a) emergency and alarm systems, including emergency lighting;
    - (b) medical equipment; or
    - (c) cordless power tools.
  - Results shown is/are of total weight of the battery sample.
  - "--" = Not Regulated.
  - According to the article 21.1, all batteries, accumulators and battery packs should be appropriately marked with the crossed-out wheeled bin symbol.

### Test Process:



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### Photo(s) of the sample(s)



**\*\*\* End of Report \*\*\***

*Remark: This report is considered invalidated without the Special Seal for Inspection of the TCT. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of TCT, this test report shall not be copied except in full and published as advertisement.*



# TEST REPORT

**Reference No.**..... : WTF21D04030467B  
**Applicant**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Manufacturer** ..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Product Name**..... : Rechargeable Li-ion Cell  
**Model No.**..... : 801727  
**Trade Mark**..... : N/A  
**Total pages**..... : 22 pages  
**Standards**..... : IEC 62133-2:2017  
**Date of Receipt sample** .... : 2021-04-19  
**Date of Test**..... : 2021-04-19~2021-05-17  
**Date of Issue**..... : 2021-05-18  
**Test Result**..... : The submitted samples comply with the above standards

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Testing Group Co., Ltd.**

Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China

Tel:+86-769-2267 6998

Fax:+86-769-2267 6828

Compiled by:

*Dardy Cheng*

Dardy Cheng / Project Engineer

Approved by:

*Deval qin*

Deval Qin / Designated Reviewer


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

Attachments 1: Photos documentation (1 pages);

**Summary of testing:**
**Tests performed (name of test and test clause):**

- 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)  
 7.3.8.1 Vibration  
 7.3.8.2 Mechanical shock  
 7.3.9 Design evaluation – Forced internal short circuit (cells)

**Testing location:**
**Waltek Testing Group Co., Ltd.**

 No. 77, Houjie Section, Guantai Road,  
 Houjie Town, Dongguan City, Guangdong, China

**Summary of compliance with National Differences(List of countries addressed): N/A**

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



<b>Test item particulars:</b>	
<b>Classification of installation and use</b> .....	Built-in and use in portable applications
<b>Supply connection</b> .....	Customize DC connection.
<b>Recommend charging method declared by the manufacturer</b> .....	Charge at a constant current 140mA(0.5C) till voltage reaches 4.2V, then charge at a constant voltage 4.2V till current reduce to 2.8mA.
<b>Discharge current (0,2 I<sub>t</sub> A)</b> .....	56mA
<b>Specified final voltage:</b> .....	3V
<b>Upper limit charging voltage per cell:</b> .....	4.23V
<b>Maximum charging current</b> .....	280mA
<b>Charging temperature upper limit</b> .....	45°C
<b>Charging temperature lower limit</b> .....	0 °C
<b>Polymer cell electrolyte type</b> .....	<input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer <input checked="" type="checkbox"/> N/A
<b>Possible test case verdicts:</b>	
- 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)	
<b>Testing</b> .....	
<b>Date of receipt of test item</b> .....	2021-04-19
<b>Date (s) of performance of tests</b> .....	2021-04-19~2021-05-17
<b>General remarks:</b>	
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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
<b>Name and address of factory (ies)</b> .....: Same as manufacturer	

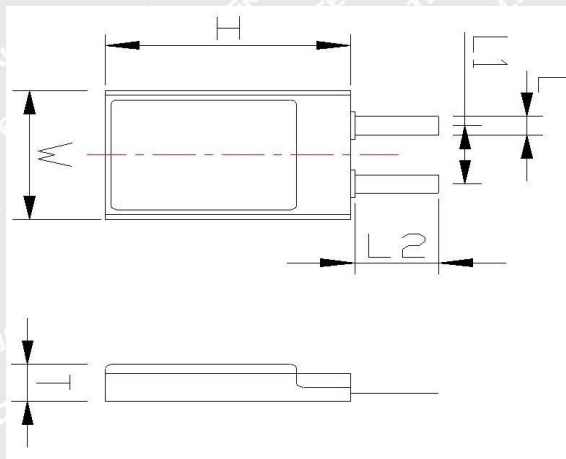
**General product information:**

The cells and batteries have been tested and evaluated according to their specified working conditions (as given below ), which are provided by client.

Details information of the cell and battery, as following:

Product	Cell
Model	801727
Nominal voltage	3.7V
Rated capacity	280mAh
Charge method	CC/CV
Charge temp. range	0~45°C
Std. charge current	140mA
Max. charge current	280mA
Max. discharge current	280mA
Upper limit charge voltage	4.23V
End-of-charge current	2.8mA
Discharge Cut-off voltage	3V
Dimension	28.0mm x 18.0mm x 8.2mm
Weight	Approx. 5.89g
Shape	Prismatic

Construction :



L	2±0.2	L1	4±2	L2	5±2
T	8.0+0.2 - 0.2	W	17.5+0.5 - 0.5	H	27.0+1 -1
Units: mm					

**Copy of marking plate**

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

-Rechargeable Li-ion Cell

801727 ICP9/18/28

3.7Vd.c., 280mAh, 1.036Wh

YYYYMMDD

+Mid Ocean Brands B.V.



Remark: "YYYY" represents the year of manufactured, "MM" represents the month of manufactured, "DD" represents the day of manufactured.

# WALTEK





IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>Parameter measurement tolerances</b>		<b>P</b>
	Parameter measurement tolerances	All control and measure values were within the tolerances.	P
<b>5</b>	<b>General safety considerations</b>		<b>P</b>
5.1	General	Considered	P
5.2	Insulation and wiring		P
	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		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		P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	Temperature/voltage/current management		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		N/A
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		N/A



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		N/A
	Terminal contacts are arranged to minimize the risk of short circuits		N/A
5.6	Assembly of cells into batteries		N/A
5.6.1	General		N/A
	Each battery has 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 was provide esternal 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 has 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 are added as appropriate and consideration given to the end-device application		N/A
	The manufacturer of the battery provides 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, the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2;		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 Table 2, by monitoring the voltage of every single cell or the single cellblocks		N/A



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	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 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 were not 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
	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		N/A
	Mechanical protection for cells, cell connections and control circuits within the battery were provided to prevent damage as a result of intended use and reasonably foreseeable misuse.		N/A
	The mechanical protection was provided by the battery case or by the end product enclosure for those batteries intended for building into an end product		N/A
	The battery case and compartments housing cells were 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 was considered when conducting mechanical tests		N/A
5.7	Quality plan		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		P
5.8	Battery safety components		N/A



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict

<b>6</b>	<b>Type test and sample size</b>		P
	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.		P
	The internal resistance of coin cells be measured in accordance with Annex D. Coin cells with internal resistance less than or equal to 3 Ω were tested in accordance with Table 1.		N/A
	Unless noted otherwise in the test methods, testing was 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 over discharge protection	Considered.	P
	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	Considered.	P

<b>7</b>	<b>Specific requirements and tests</b>		P
7.1	Charging procedures for test purposes	Considered.	P
7.1.1	First procedure: This charging procedure applied to tests other than those specified in 7.1.2	See below.	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 shall 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: This charging procedure applied to the tests of 7.3.1, 7.3.4, 7.3.5, and 7.3.9		P
	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	See below	P
7.2.1	Continuous charging at constant voltage (cells)	Considered	P
	Results: No fire, no explosion, no leakage .....	No fire, no explosion, no leakage (See Table 7.2.1)	P



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.2	Case stress at high ambient temperature (battery)		N/A
	Oven temperature (°C)..... :	--	--
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A
7.3	Reasonably foreseeable misuse	See below	P
7.3.1	External short-circuit (cell)	Considered	P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The surface temperature declined by 20% of the maximum temperature rise	Considered	P
	Results: No fire, no explosion..... :	No fire. No explosion (See 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 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 were conducted on one to four of the five samples before conducting the short-circuit test		N/A
	Results: No fire, no explosion..... :	(See Table 7.3.2)	N/A
7.3.3	Free fall	Considered	P
	Results: No fire, no explosion.	No fire, no explosion.	P
7.3.4	Thermal abuse (cells)	Considered	P
	The cells were held at 130°C ± 2°C for 30 minutes;	Considered	P
	Oven temperature (°C)..... :	The oven temperature was raised at a rate of 5°C /min ± 2°C /min to a temperature of 130°C ± 2°C.	--
	Results: No fire, no explosion.	No fire, no explosion	P
7.3.5	Crush (cells)	Considered	P
	The crushing force was released upon: - The maximum force of 13 kN ± 078 kN has been applied; or	Considered	P



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	Results: No fire, no explosion .....	No fire, no explosion (See Table 7.3.5)	P
7.3.6	Over-charging of battery		N/A
	Sample batteries be charged at a constant current of 2.0 It A, using a supply voltage which is:		N/A
	- 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 presented 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: - 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 7.3.6)	N/A
7.3.7	Forced discharge (cells)	Considered.	P
	- The discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A
	- The discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test terminated at the end of the testing duration		P
	Results: No fire. No explosion.....	(See Table 7.3.7)	P
7.3.8	Mechanical tests (batteries)		N/A
7.3.8.1	Vibration		N/A
	Results: No fire, no explosion, no rupture, no leakage or venting.	(See Table 7.3.8.1)	N/A
7.3.8.2	Mechanical shock		N/A
	Results: No leakage, no venting, no rupture, no explosion and no fire during test	(See Table 7.3.8.2)	N/A
7.3.9	Design evaluation – Forced internal short circuit (cells)		P



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells complied with national requirement for .....	France, Japan, Korea, Switzerland	--
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		P
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	P
	Results: No fire .....	No fire (See Table 7.3.9)	P

<b>8</b>	<b>Information for safety</b>		<b>P</b>
<b>8.1</b>	<b>General</b>		
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Showed in 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.		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, information relating to hazard avoidance resulting from a system analysis is provided to the end user		P
	Do not allow children to replace batteries without adult supervision		P
<b>8.2</b>	<b>Small cell and battery safety information</b>	<b>Small cell</b>	<b>P</b>
	Small cells and batteries and equipment using small cells and batteries are to be provided with information regarding ingestion hazards		P
	Small cells and batteries that may pose an ingestion hazard are those that can fit within the limits of the ingestion gauge shown in Figure 3.		P
	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		P
	-Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		P
	-In case of ingestion of a cell or battery, seek medical assistance promptly		P



IEC 62133-2:2017			
Clause	Requirement + Test	Result - Remark	Verdict
<b>9</b>	<b>Marking</b>		<b>P</b>
9.1	Cell marking		P
	Cells marked as specified in IEC 61960		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. However, the cell marking can be indicated with the battery, the instructions and/or the specifications.		P
9.2	Battery marking		N/A
	Batteries marked as specified in IEC 61960		N/A
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity		N/A
	Batteries 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	See below.	P
	Storage and disposal instructions marked on or supplied with the battery.	Information for safety mentioned in manufacturer's specification.	P
	Recommended charging instructions marked on or supplied with the battery.	Information for safety mentioned in manufacturer's specification.	P
<b>10</b>	<b>Packaging and transport</b>		<b>P</b>
	Packaging for coin cells shall not be small enough to fit within the limits of the ingestion gauge of Figure 3	Considered.	P





## IEC 62133-2:2017

Clause	Requirement + Test	Result - Remark	Verdict
<b>Annex A</b>	<b>Charging range of secondary lithium ion cells for safe use</b>		<b>P</b>
A.1	General		P
A.2	Safety of lithium-ion secondary battery		P
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage	4.23V	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		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	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: 0-45°C.	P
A.4.3	High temperature range	Higher than the temperature range specific in this standard.	P
A.4.3.1	General		P
A.4.3.2	Explanation of safety viewpoint		N/A
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	45°C applied.	P
A.4.4	Low temperature range	Lower than the temperature range specific in this standard.	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		N/A
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	-5°C applied.	P
A.4.5	Scope of the application of charging current		P
A.4.6	Consideration of discharge		P
A.4.6.1	General		P



## IEC 62133-2:2017

Clause	Requirement + Test	Result - Remark	Verdict
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
	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		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Marking the position of nickel particle on the both ends of winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		P
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

**IEC 62133-2:2017**

Clause	Requirement + Test	Result - Remark	Verdict
<b>Annex D</b>	Measurement of the internal AC resistance for coin cells		N/A
<b>D.1</b>	General		N/A
<b>D.2</b>	Method		N/A
<b>Annex E</b>	Packaging and transport		P
<b>Annex F</b>	Component standards references		P

# WALTEK



TABLE: Critical components information					P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>
Cell	Mid Ocean Brands B.V.	801727	3.7V, 280mAh	IEC 62133-2: 2017	Test with appliance
Electrolyte	--	--	LiPF6	--	--
Separator	--	--	PP, PVDF, Shutdown temperature: 135°C.	--	--
Positive electrode	--	--	LiCoO <sub>2</sub> , Al foil	--	--
Negative electrode	--	--	Graphite, Cu foil	--	--
<b>Supplementary information:</b>					
<b><sup>1)</sup> Provided evidence ensures the agreed level of compliance.</b>					

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7.2.1	TABLE: Continuous charging at constant voltage (cells)				P
Model	Recommended charging voltage $V_c$ , (Vdc)	Recommended charging current $I_{rec}$ , (A)	OCV at start of test, (Vdc)	Results	
801727 (C1#)	4.2	0.14	4.197	A,B	
801727 (C2#)	4.2	0.14	4.196	A,B	
801727 (C3#)	4.2	0.14	4.197	A,B	
801727 (C4#)	4.2	0.14	4.198	A,B	
801727 (C5#)	4.2	0.14	4.196	A,B	

**Supplementary information:**  
 A - No fire or explosion      B - No leakage      C - Leakage  
 D - Fire      E - Explosion      F - Others (please explain)

7.3.1	TABLE: External short circuit (cell)					P
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, ( $\Omega$ )	Maximum case temperature rise $\Delta T$ , (°C)	Results	
<b>Samples charged at charging temperature upper limit (45°C)</b>						
801727 (C6#)	55.4	4.200	0.084	112.9	A,E	
801727 (C7#)	55.8	4.198	0.083	113.9	A,E	
801727 (C8#)	55.6	4.201	0.084	122.2	A,E	
801727 (C9#)	55.8	4.204	0.083	119.8	A,E	
801727 (C10#)	55.4	4.208	0.084	121.4	A,E	
<b>Samples charged at charging temperature lower limit (-5°C)</b>						
801727 (C11#)	55.5	4.107	0.084	115.4	A,E	
801727 (C12#)	55.8	4.098	0.088	114.8	A,E	
801727 (C13#)	55.6	4.108	0.086	124.9	A,E	
801727 (C14#)	55.8	4.108	0.087	123.8	A,E	
801727 (C15#)	55.5	4.107	0.084	119.9	A,E	

**Supplementary information:**  
 A - No fire or explosion      B - Fire      C - Explosion      D - The test was completed after 24 h  
 E - The test was completed after the cell casing cooled to 20% of the maximum temperature rise



7.3.2	TABLE: External short circuit (battery)					N/A
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise $\Delta T$ , (°C)	Component single fault condition	Results

**Supplementary information:**  
 A – No fire or Explosion    B – Fire    C – Explosion    D – The test was completed after 24 h  
 E – The test was completed after the cell casing cooled to 20% of the maximum temperature rise  
 F – The per cell voltage (series cells only) of the battery is below 0.8 V and is decreasing by less than 0.1 V in a 30-minute period.  
 G - In case of rapid decline in short circuit current, the battery pack should remain on test for an additional one hour after the current reaches a low end steady state condition.

7.3.5	TABLE: Crush(Cell)			P
Model	OCV at start of test, (Vdc)	OCV at removal of crushing force, (Vdc)	Results	
<b>Samples charged at charging temperature upper limit (45°C)</b>				
801727 (C29#)	4.203	4.203	A	
801727 (C30#)	4.200	4.199	A	
801727 (C31#)	4.198	4.198	A	
801727 (C32#)	4.201	4.200	A	
801727 (C33#)	4.200	4.199	A	
<b>Samples charged at charging temperature lower limit (-5°C)</b>				
801727 (C34#)	4.095	4.094	A	
801727 (C35#)	4.101	4.098	A	
801727 (C36#)	4.102	4.102	A	
801727 (C37#)	4.102	4.101	A	
801727 (C38#)	4.097	4.096	A	

**Supplementary information:**  
 A - No fire or explosion                      B - Fire                      C - Explosion  
 D - Others (please explain)



7.3.6		TABLE: Over-charging of battery			N/A
Constant charging current (A) .....					--
Supply voltage (Vdc) .....					--
Model	OCV before charging, (Vdc)	Total charging time (min)	Maximum outer casing temperature, (°C)	Results	
<b>Supplementary information:</b>					
A - No fire or explosion		B - Fire		C - Explosion	
D - Others (please explain)					

7.3.7		TABLE: Forced discharge (cells)			P
Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I <sub>r</sub> , (A)	Time for reversed charge, (minutes)	Results	
801727 (C39#)	3.315	0.28	90	A	
801727 (C40#)	3.323	0.28	90	A	
801727 (C41#)	3.317	0.28	90	A	
801727 (C42#)	3.311	0.28	90	A	
801727 (C43#)	3.298	0.28	90	A	
<b>Supplementary information:</b>					
A - No fire or explosion		B - Fire		C - Explosion	
D - Others (please explain)					

7.3.8.1		TABLE: Vibration			N/A
Model	OCV (V)		Mass of Test Battery (g)		Result
	Before test	After test	Before test	After test	
<b>Supplementary information:</b>					
A- No Fire, No Explosion, No rupture, No Leakage or venting					
B- Others					







### Attachment 1 Photo Documentation

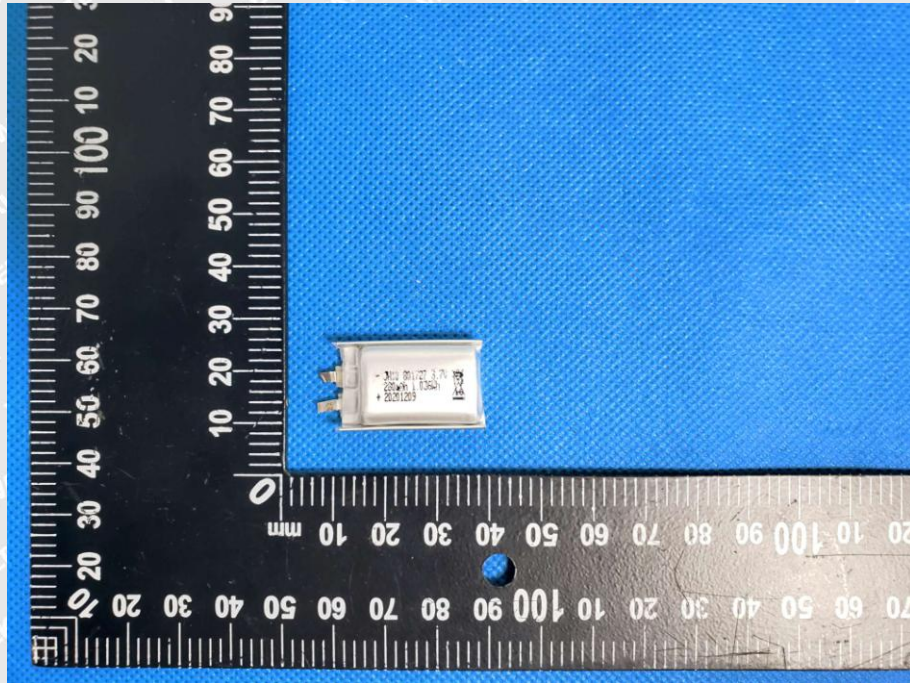


Photo 1

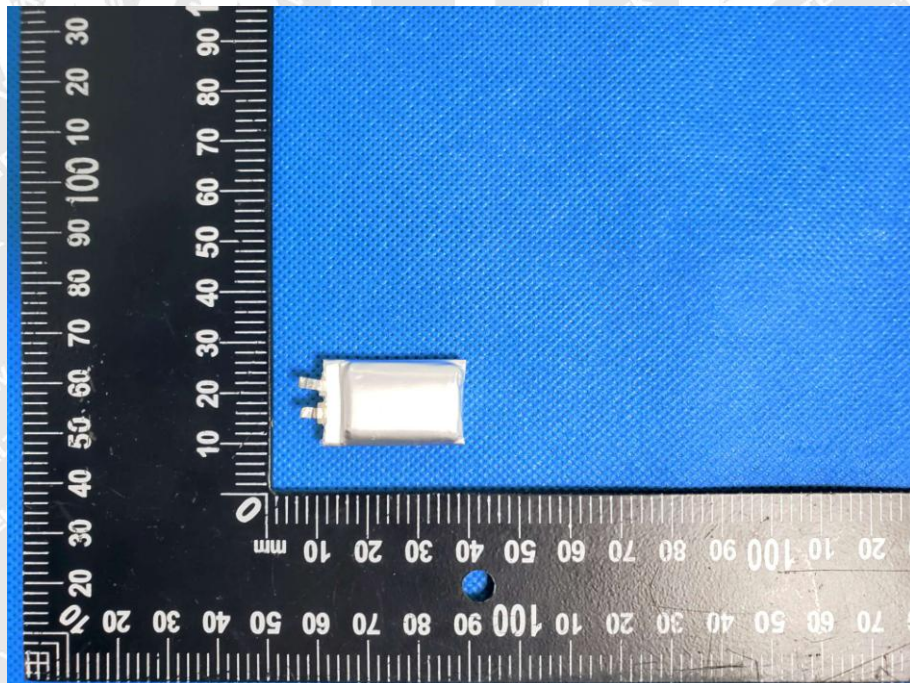


Photo 2

===== End of Report =====