

IEC 60086-4 TEST REPORT

For

Lithium Cell

Model: CR2032

Prepared for: SHENZHEN PKCELL BATTERY CO., LTD.
2nd Floor, 4th Building, Meitai Technology Park, No.1231, Guanguang
Road, Osmanthus Community, Guanlan Town, Longhua New Area,
Shenzhen

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Report Number: NCT20046289XI5-1
Date of Test: Nov. 12, 2020 ~ Dec. 10, 2020
Date of Issue: Dec. 10, 2020

Tested By: _____

Dylan Zhu

Reviewed By: _____

Hely Wang

Approved By: _____

Boris Lin



The results detailed in this test report relate only to the specific sample(s) tested. This report is not to be reproduced except in full, without written approval from NCT Testing Technology.

TEST REPORT IEC 60086-4 Primary batteries Part 4: Safety of lithium batteries	
Report Number.....	NCT20046289XI5-1
Date of issue	2020-12-10
Total number of pages.....	22 pages
Applicant's name	SHENZHEN PKCELL BATTERY CO., LTD.
Address	2nd Floor, 4th Building, Meitai Technology Park, No.1231, Guangang Road, Osmanthus Community, Guanlan Town, Longhua New Area, Shenzhen
Test specification:	
Standard.....	IEC 60086-4:2019
Test procedure.....	Test Report
Non-standard test method.....	N/A
Test item description.....	Lithium Cell
Trade Mark	PKCELL
Manufacturer.....	Same as applicant
Address	Same as applicant
Model/Type reference.....	CR2032
Ratings	3.0V, 210mAh

Testing procedure and testing location:	
Testing Laboratory:	
Testing location/ address.....:	Shenzhen NCT Testing Technology Co., Ltd. 1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street, Baoan District, Shenzhen, Guangdong, China.
List of Attachments:	
Appendix 1: 1 page of Photo Documentation	
Summary of testing:	
Tests performed (name of test and test clause): 6.4.1 Test A: Altitude 6.4.2 Test B: Thermal cycling 6.4.3 Test C: Vibration 6.4.4 Test D: Shock 6.5.1 Test E: External short-circuit 6.5.3 Test G: Crush 6.5.4 Test H: Forced discharge 6.5.5 Test I: Abnormal charging 6.5.6 Test J: Free fall 6.5.7 Test K: Thermal abuse	Testing location: Shenzhen NCT Testing Technology Co., Ltd. 1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street, Baoan District, Shenzhen, Guangdong, China.
Summary of compliance with National Differences	
N/A	

Copy of marking plate:



Information for safety mentioned on Cell's package:



CAUTION

Potential for fire or burning. Do not disassemble, puncture, crush, heat or burn. Do not charge batteries. 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.



警告

为防止起火或爆炸，请勿拆解，穿刺，压碎，加热或燃烧本电池。不要给电池充电。将电池放在儿童无法触及的地方。误吞咽可能导致灼伤，软组织穿孔和死亡。摄入后2小时内可能发生严重烧伤。如果误吞入电池，请立即寻求医疗帮助。

Test item particulars	
Classification of installation and use	To be defined in final product
Supply connection.....	DC supply
Weight of Battery	2.8g
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.....	2020-11-12
Date (s) of performance of tests	2020-11-12 to 2020-12-10
General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Name and address of factory (ies)	
Same as applicant	

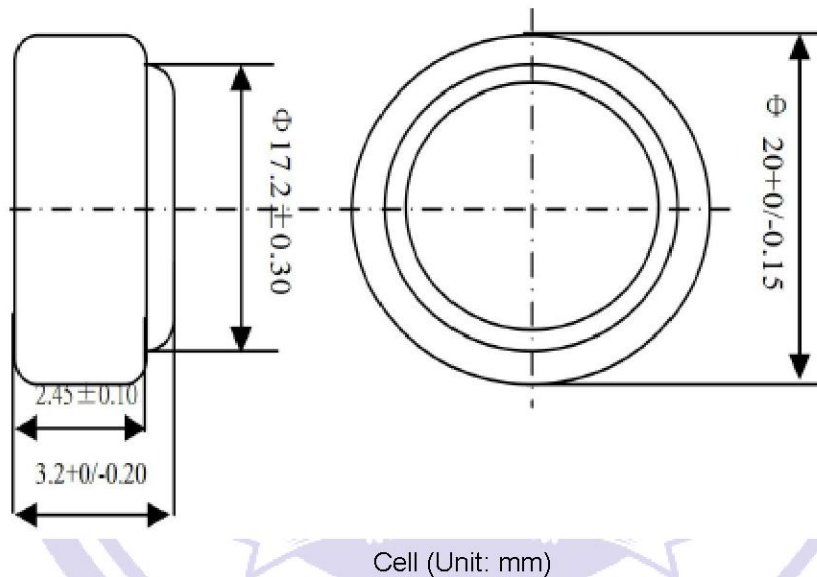
General product information:

The product is a Lithium Cell, without any protective circuit.

The main features of the cell are shown as below:

Model	Nominal capacity	Nominal voltage	Maximum discharge current	Discharge cut-off voltage
CR2032	210mAh	3.0V	4.2mA	2.0V

Construction:



Circuit diagram:

None, cell only.

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
4	REQUIREMENTS FOR SAFETY		P
4.1	Design		P
	a) Abnormal temperature rise above the critical value prevented		P
	b) Temperature increases in the battery controlled		P
	c) Lithium Manganese dioxide Cells and batteries designed to relieve excessive internal pressure or to preclude a violent rupture under conditions of transport, intended use and reasonably foreseeable misuse	Pressure relieving device exists.	P
4.2	Quality plan		P
	Manufacturer prepared and implemented a quality plan defining the procedures for the inspection of materials, components, cells and batteries during the course of manufacture, to be applied to the total process of producing a specific type of battery	Complied. ISO 9001: 2015 certificate provided.	P
	Manufactures understood their process capabilities and instituted the necessary process controls as they relate to product safety		P
5	TYPE TESTING AND SAMPLING		P
5.1	Validity of testing		P
5.2	Test samples		P
6	TESTING AND REQUIREMENTS		P
6.1	General	Complied.	P
6.1.1	Test application matrix	(See 6.2)	P
	s: cell or single cell battery	Cell only.	P
	m: multi cell battery		N/A
6.1.3	Ambient temperature (°C)	20°C ± 5°C.	P
6.1.4	Parameter measurement tolerances		P
6.1.5	Predischarge		P
6.1.6	Additional cells		P
6.2	Evaluation of test criteria		P
6.2.1	Short-circuit		P
6.2.2	Excessive temperature rise		P
6.2.3	Leakage		P
6.2.4	Venting		P
6.2.5	Fire		P

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.6	Rupture		P
6.2.7	Explosion		P
6.3	Tests and requirements – Overview	(See table 4 in the standard)	P
6.4	Tests for intended use		P
6.4.1	Test A: Altitude	(See appended Table 1 and Table 6.4.1)	P
6.4.2	Test B: Thermal cycling	(See appended Table 1 and Table 6.4.2)	P
6.4.3	Test C: Vibration	(See appended Table 1 and Table 6.4.3)	P
6.4.4	Test D: Shock	(See appended Table 1 and Table 6.4.4)	P
6.5	Tests for reasonably foreseeable misuse		P
6.5.1	Test E: External short-circuit	(See appended Table 1 and Table 6.5.1)	P
6.5.2	Test F: Impact	(See appended Table 1 and Table 6.5.2)	N/A
6.5.3	Test G: Crush	(See appended Table 1 and Table 6.5.3)	P
6.5.4	Test H: Forced discharge	(See appended Table 1 and Table 6.5.4)	P
6.5.5	Test I: Abnormal charging	(See appended Table 1 and Table 6.5.5)	P
6.5.6	Test J: Free fall	(See appended Table 1 and Table 6.5.6)	P
6.5.7	Test K: Thermal abuse	(See appended Table 1 and Table 6.5.7)	P
6.5.8	Test L: Incorrect installation	Not CR17345, CR15H270 and similar type batteries.	N/A
6.5.9	Test M: Overdischarge	Not CR17345, CR15H270 and similar type batteries.	N/A
6.6	Information given in the relevant specification		P
	a) Predischarge current or resistive load and end-point voltage specified by the manufacturer.....	Discharging current: 2.1mA; End point voltage: 2.0V	P
	b) Method to measure the energy of an explosion, if any		N/A
	c) Shape: prismatic, flexible, coin or cylindrical Diameter: less than 18 mm or not less than 18 mm	Coin cell.	P

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
	d) Maximum continuous discharge current specified by the manufacturer for test H.....:	Max. continuous discharge current: 4.2mA.	P
	e) Rated capacity specified by the manufacturer for test H.....:	Rated Capacity: 210mAh.	P
	f) Abnormal charging current declared by the manufacturer for test I	10.5mA as specified by manufacturer applied.	P
	g) Normal reverse current declared by the manufacturer which applied to the battery during its operating life.....:		N/A
7	INFORMATION FOR SAFETY		P
7.1	Safety precautions during design of equipment		P
7.1.1	General		P
7.1.2	Charge protection	Considered in end product.	N/A
7.1.3	Parallel connection	Considered in end product.	N/A
7.2	Precautions during handling of batteries	Information for safety mentioned in manufacturer's specifications.	P
7.3	Packaging		P
7.4	Handling of battery cartons		N/A
7.5	Transport		P
7.5.1	General		P
7.5.2	Air transport		P
7.5.3	Sea transport		P
7.5.4	Land transport		P
7.6	Display and storage	Information for display and storage mentioned in manufacturer's specifications.	P
7.7	Disposal	Information for disposal instructions mentioned in manufacturer's specifications.	P
8	INSTRUCTIONS FOR USE	Information for use mentioned in manufacturer's specifications.	P
9	MARKING AND PACKAGING		P
9.1	General	See the label.	P
9.2	Swallowable batteries	Caution for ingestion marked on the immediate package.	P
9.3	Safety pictograms		P

IEC 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX A	(INFORMATIVE) GUIDELINES FOR THE ACHIEVEMENT OF SAFETY OF LITHIUM BATTERIES		N/A
ANNEX B	(INFORMATIVE) GUIDELINES FOR DESIGNERS OF EQUIPMENT USING LITHIUM BATTERIES		N/A
ANNEX C	(INFORMATIVE) ADDITIONAL INFORMATION ON DISPLAY AND STORAGE		N/A
ANNEX D	(INFORMATIVE) SAFETY PICTOGRAMS		N/A
D.1	General		N/A
D.2	Pictograms		N/A
D.3	Instruction for use		N/A
ANNEX E	(NORMATIVE) CHILD RESISTANT PACKAGING OF COIN CELLS		N/A
E.1	General		N/A
E.2	Applicability		N/A
E.3	Packaging tests		N/A
E.3.1	General		N/A
E.3.2	Test items		N/A
E.3.3	Test procedure		N/A
E.3.4	Criteria		N/A
ANNEX F	(INFORMATIVE) USE OF THE KEEP OUT OF REACH OF CHILDREN SAFETY SIGN		N/A
F.1	General		N/A
F.2	Safety sign		N/A
F.3	Best practices for marking the packaging		N/A
F.4	Best practices for marking the cell		N/A

TABLE: Critical components information						P
Object / part No.	Manufacturer / trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Cell	SHENZHEN PKCELL BATTERY CO., LTD.	CR2032	3.0V, 210mAh	IEC 60086-4: 2019	Tested with appliance	
- Anode shell	YJ Co., Ltd.	0.23*32.0*C	10Cr17	--	--	
- Cathode shell	YJ Co., Ltd.	0.23*32.0*C	10Cr17	--	--	
-Cathode	XT Co., Ltd.	AW type	Manganese content≥91%	--	--	
-Anode	YHW Co., Ltd.	1.3*11.5	Lithium content≥99.9%	--	--	
-Separator	JY Co., Ltd.	Y18-20T	100%PP	--	--	
-Electrolyte	BH co., Ltd.	BS-II-010	Density : 1.09~1.15g/cm ³ , water contents≤50ppm	--	--	
Supplementary information:						
¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.						

TABLE 1 (clause 6.4.1 – 6.5.9)					
Tests	Cell / battery type	Discharge state	Number of test sample	Test result	Verdict
A to D	Cells and single cell batteries	Undischarged	10	NL, NV, NC, NR, NE, NF	P
		Fully discharged	10	NL, NV, NC, NR, NE, NF	P
	Multi-cell batteries	Undischarged	4		N/A
		Fully discharged	4		N/A
E	Cells and single cell batteries	Undischarged	10	NT, NR, NE, NF	P
		Fully discharged	10	NT, NR, NE, NF	P
	Multi-cell batteries	Undischarged	4		N/A
		Fully discharged	4		N/A
F	Cells and single cell batteries	Undischarged	5		N/A
		Fully discharged	5		N/A
	Multi-cell batteries	Undischarged	5 component cells		N/A
		Fully discharged	5 component cells		N/A
G	Cells and single cell batteries	Undischarged	5	NT, NE, NF	P
		Fully discharged	5	NT, NE, NF	P
	Multi-cell batteries	Undischarged	5 component cells		N/A
		Fully discharged	5 component cells		N/A
H	Cells and single cell batteries	Fully discharged	10	NE, NF	P
	Multi-cell batteries	Fully discharged	10 component cells		N/A
I	Cells and single cell batteries	Undischarged	5	NE, NF	P
	Multi-cell batteries	Undischarged	5		N/A
J	Cells and single cell batteries	Undischarged	5	NV, NE, NF	P
	Multi-cell batteries	Undischarged	5		N/A
K	Cells and single cell batteries	Undischarged	5	NE, NF	P
	Multi-cell batteries	Undischarged	5		N/A
L	Cells and single cell batteries	Undischarged	20		N/A

M	Cells and single cell batteries	50 % predischarged	20		N/A
		75 % predischarged	20		N/A

Supplementary information:

NC: No short-circuit

NE: No explosion

NF: No fire

NL: No leakage

NR: No rupture

NT: No excessive temperature rise

NV: No venting



6.4.1	TABLE: Test A: Altitude (Undischarged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	3.343	2.723	3.341	2.723
#2	3.346	2.708	3.343	2.708
#3	3.352	2.803	3.350	2.803
#4	3.344	2.794	3.341	2.793
#5	3.353	2.828	3.351	2.828
#6	3.352	2.735	3.350	2.734
#7	3.344	2.808	3.341	2.808
#8	3.350	2.750	3.348	2.750
#9	3.348	2.805	3.346	2.804
#10	3.343	2.734	3.340	2.733
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				
6.4.1	TABLE: Test A: Altitude (Fully discharged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	2.724	2.748	2.723	2.747
#2	2.757	2.733	2.757	2.732
#3	2.826	2.799	2.826	2.799
#4	2.822	2.748	2.821	2.748
#5	2.766	2.762	2.766	2.761
#6	2.754	2.761	2.753	2.760
#7	2.820	2.770	2.820	2.770
#8	2.777	2.795	2.776	2.794
#9	2.806	2.731	2.806	2.731
#10	2.819	2.817	2.819	2.817
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				

6.4.2	TABLE: Test B: Thermal cycling (Undischarged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	3.341	2.723	3.327	2.721
#2	3.343	2.708	3.329	2.706
#3	3.350	2.803	3.336	2.800
#4	3.341	2.793	3.333	2.789
#5	3.351	2.828	3.337	2.824
#6	3.350	2.734	3.338	2.729
#7	3.341	2.808	3.329	2.804
#8	3.348	2.750	3.334	2.747
#9	3.346	2.804	3.335	2.800
#10	3.340	2.733	3.333	2.728
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				
6.4.2	TABLE: Test B: Thermal cycling (Fully discharged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	2.723	2.747	2.722	2.744
#2	2.757	2.732	2.756	2.728
#3	2.826	2.799	2.824	2.796
#4	2.821	2.748	2.820	2.743
#5	2.766	2.761	2.764	2.757
#6	2.753	2.760	2.752	2.756
#7	2.820	2.770	2.819	2.766
#8	2.776	2.794	2.774	2.790
#9	2.806	2.731	2.804	2.728
#10	2.819	2.817	2.818	2.813
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				

6.4.3	TABLE: Test C: Vibration (Undischarged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	3.327	2.721	3.325	2.721
#2	3.329	2.706	3.326	2.705
#3	3.336	2.800	3.333	2.799
#4	3.333	2.789	3.329	2.789
#5	3.337	2.824	3.335	2.823
#6	3.338	2.729	3.336	2.729
#7	3.329	2.804	3.326	2.803
#8	3.334	2.747	3.330	2.746
#9	3.335	2.800	3.333	2.799
#10	3.333	2.728	3.331	2.728
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				
6.4.3	TABLE: Test C: Vibration (Fully discharged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	2.722	2.744	2.721	2.743
#2	2.756	2.728	2.756	2.728
#3	2.824	2.796	2.824	2.796
#4	2.820	2.743	2.820	2.743
#5	2.764	2.757	2.763	2.756
#6	2.752	2.756	2.752	2.755
#7	2.819	2.766	2.819	2.766
#8	2.774	2.790	2.773	2.790
#9	2.804	2.728	2.803	2.728
#10	2.818	2.813	2.818	2.813
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				

6.4.4	TABLE: Test D: Shock (Undischarged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	3.325	2.721	3.323	2.721
#2	3.326	2.705	3.324	2.704
#3	3.333	2.799	3.330	2.798
#4	3.329	2.789	3.326	2.788
#5	3.335	2.823	3.333	2.822
#6	3.336	2.729	3.333	2.729
#7	3.326	2.803	3.323	2.802
#8	3.330	2.746	3.327	2.746
#9	3.333	2.799	3.330	2.799
#10	3.331	2.728	3.329	2.728
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				
6.4.4	TABLE: Test D: Shock (Fully discharged)			P
Batt. No.	Before test		After test	
	battery voltage (V)	battery weight (g)	battery voltage (V)	battery weight (g)
#1	2.721	2.743	2.721	2.742
#2	2.756	2.728	2.755	2.728
#3	2.824	2.796	2.824	2.795
#4	2.820	2.743	2.820	2.742
#5	2.763	2.756	2.762	2.756
#6	2.752	2.755	2.752	2.755
#7	2.819	2.766	2.819	2.765
#8	2.773	2.790	2.773	2.789
#9	2.803	2.728	2.802	2.728
#10	2.818	2.813	2.818	2.813
Supplementary information: - No mass loss, no leakage, no venting, no short-circuit, no rupture, no explosion and no fire.				

6.5.1		TABLE: Test E: External short-circuit (Undischarged)				P
Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature rise ΔT, (°C)	Results	
#1	55.0	3.323	86.4	70.3	P	
#2	55.0	3.324	88.6	69.5	P	
#3	55.0	3.330	86.1	68.9	P	
#4	55.0	3.326	84.7	69.1	P	
#5	55.0	3.333	87.7	70.6	P	
#6	55.0	3.333	86.9	68.8	P	
#7	55.0	3.323	89.4	69.8	P	
#8	55.0	3.327	88.2	68.4	P	
#9	55.0	3.330	85.8	69.2	P	
#10	55.0	3.329	89.3	70.0	P	
Supplementary information: - No excessive temperature rise (>170°C), no rupture, no explosion and no fire.						
6.5.1		TABLE: Test E: External short-circuit (Fully discharged)				P
Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (mΩ)	Maximum case temperature rise ΔT, (°C)	Results	
#1	55.0	2.721	88.4	56.3	P	
#2	55.0	2.755	87.3	55.8	P	
#3	55.0	2.824	89.5	55.7	P	
#4	55.0	2.820	86.9	56.5	P	
#5	55.0	2.762	91.7	56.5	P	
#6	55.0	2.752	87.6	55.9	P	
#7	55.0	2.819	88.2	56.1	P	
#8	55.0	2.773	89.4	56.3	P	
#9	55.0	2.802	86.3	56.6	P	
#10	55.0	2.818	87.3	56.2	P	
Supplementary information: - No excessive temperature rise (>170°C), no rupture, no explosion and no fire.						

6.5.2	TABLE: Test F: Impact (Undischarged)				N/A
Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Maximum case temperature rise ΔT , (°C)	Results	
Supplementary information: - No excessive temperature rise (>170°C), no explosion and no fire.					

6.5.2	TABLE: Test F: Impact (Fully discharged)				N/A
Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Maximum case temperature rise ΔT , (°C)	Results	
Supplementary information: - No excessive temperature rise (>170°C), no explosion and no fire.					

6.5.3	TABLE: Test G: Crush (Undischarged)				P
Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Maximum case temperature rise ΔT , (°C)	Results	
#1	24.2	3.353	25.9	P	
#2	24.2	3.346	25.4	P	
#3	24.2	3.347	25.6	P	
#4	24.2	3.349	25.8	P	
#5	24.2	3.354	25.5	P	
Supplementary information: - No excessive temperature rise (>170°C), no explosion and no fire.					
6.5.3	TABLE: Test G: Crush (Fully discharged)				P

Battery No.	Ambient, (°C)	OCV at start of test, (Vdc)	Maximum case temperature rise ΔT , (°C)	Results
#1	24.2	2.817	25.2	P
#2	24.2	2.772	24.9	P
#3	24.2	2.824	25.2	P
#4	24.2	2.796	25.5	P
#5	24.2	2.808	24.8	P
Supplementary information: - No excessive temperature rise ($>170^{\circ}\text{C}$), no explosion and no fire.				

6.5.4	TABLE: Test H: Forced discharge (Fully discharged)				P
Battery No.	OCV at start of test, (Vdc)	Max. discharge current, (A)	Test duration, (Hours)	Results	
#1	2.774	0.0042	50	P	
#2	2.786	0.0042	50	P	
#3	2.754	0.0042	50	P	
#4	2.791	0.0042	50	P	
#5	2.777	0.0042	50	P	
#6	2.806	0.0042	50	P	
#7	2.802	0.0042	50	P	
#8	2.818	0.0042	50	P	
#9	2.786	0.0042	50	P	
#10	2.773	0.0042	50	P	
Supplementary information: - No explosion and no fire.					

6.5.5	TABLE: Test I: Abnormal charging (Undischarged)				P
Battery No.	OCV at start of test, (Vdc)	Max. charge current, (A)	Test duration, (Hours)	Results	
#1	3.351	$0.0105 \times 3 = 0.0315$	16.7	P	
#2	3.346	$0.0105 \times 3 = 0.0315$	16.7	P	
#3	3.349	$0.0105 \times 3 = 0.0315$	16.7	P	
#4	3.353	$0.0105 \times 3 = 0.0315$	16.7	P	
#5	3.345	$0.0105 \times 3 = 0.0315$	16.7	P	

Supplementary information:

- No explosion and no fire.

6.5.6	TABLE: Test J: Free fall (Undischarged)		P
Batt. No.	Before test	After test	Test results
	battery voltage (V)	battery voltage (V)	
#1	3.349	3.347	P
#2	3.348	3.346	P
#3	3.347	3.346	P
#4	3.351	3.349	P
#5	3.352	3.350	P
Supplementary information: - No venting, no explosion and no fire.			

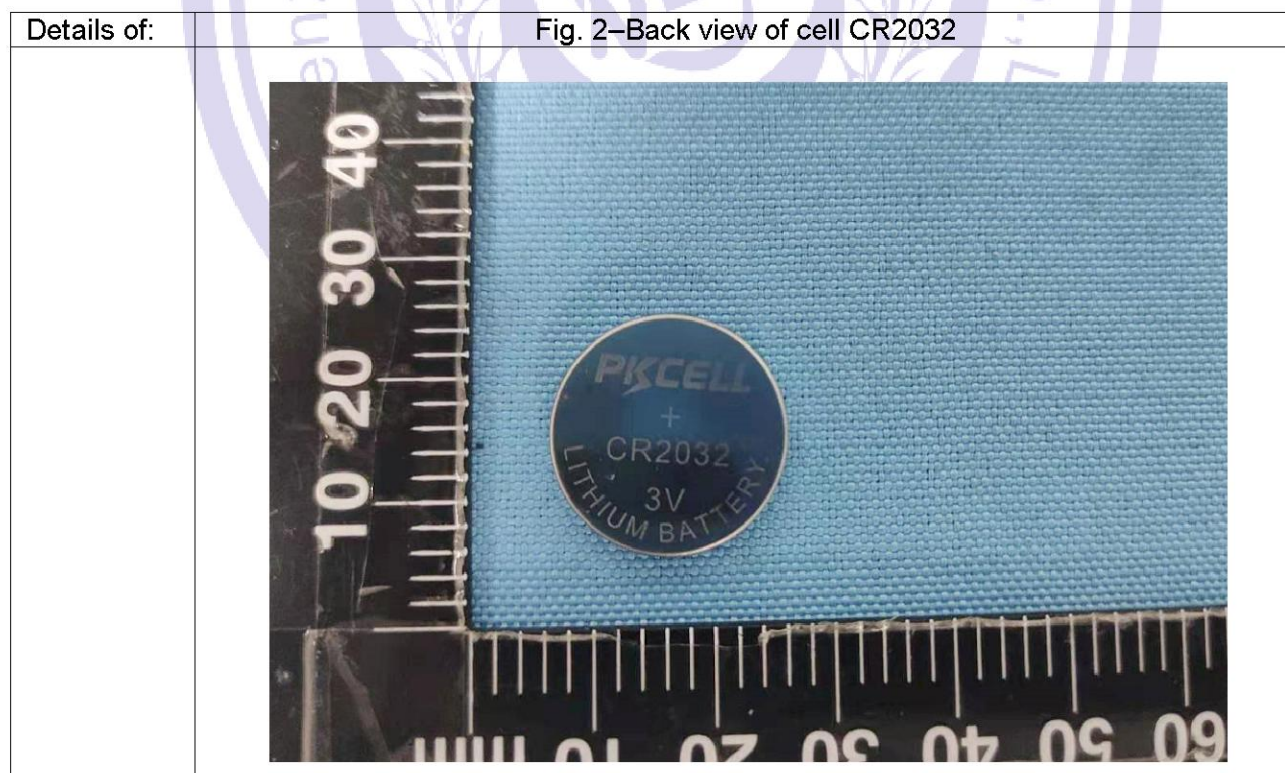
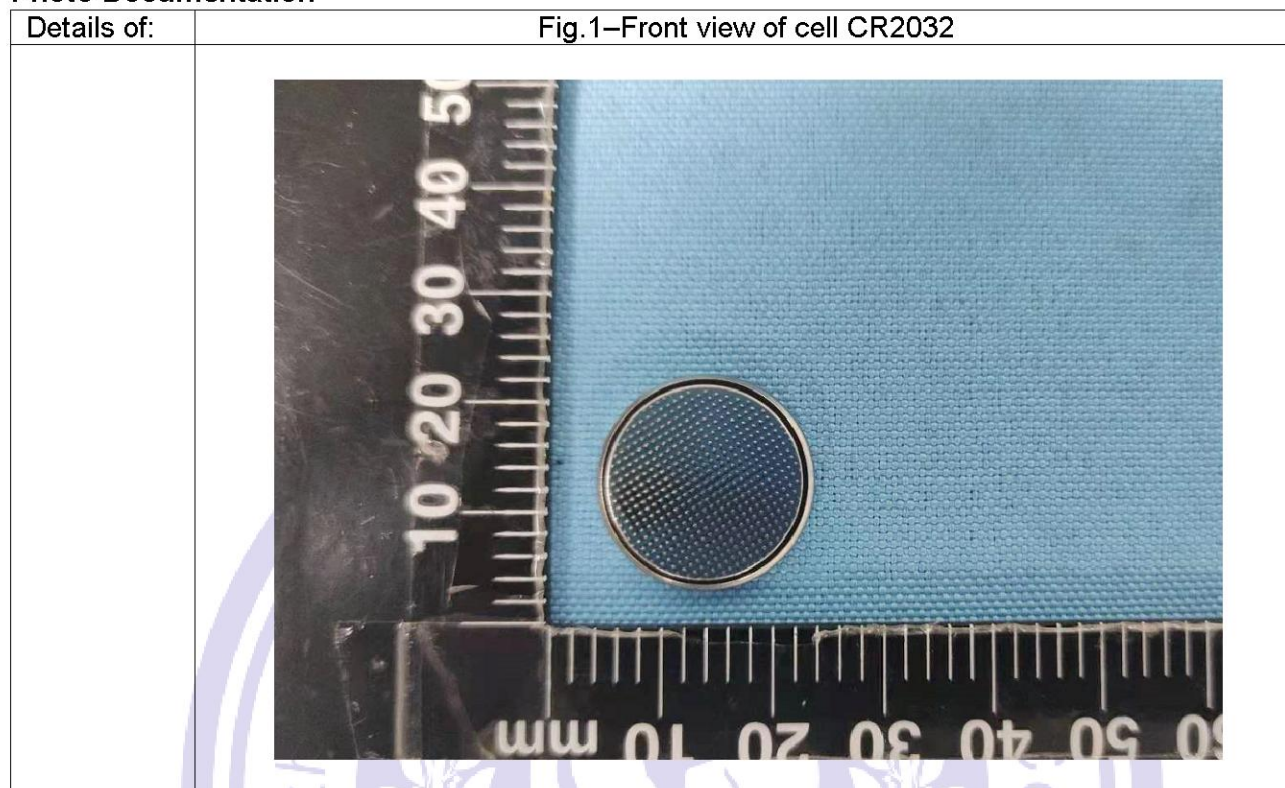
6.5.7	TABLE: Test K: Thermal abuse (Undischarged)		P
Batt. No.	Before test	After test	Test results
	battery voltage (V)	battery voltage (V)	
#1	3.349	3.346	P
#2	3.352	3.350	P
#3	3.348	3.344	P
#4	3.350	3.347	P
#5	3.351	3.349	P
Supplementary information: - No explosion and no fire.			

6.5.8	TABLE: Test L: Incorrect installation (Undischarged)	N/A
Battery No.	OCV of reversed cell, (Vdc)	Test results
Supplementary information: - No explosion and no fire.		

6.5.9	TABLE: Test M: Overdischarge (Predischarged 50%)			N/A
Battery No.	OCV prior to discharging, (Vdc)	Maximum discharge current, (A)	Time for discharging, (hours)	Results
6.5.9	TABLE: Test M: Overdischarge (Predischarged 75%)			
Battery No.	OCV prior to discharging, (Vdc)	Maximum discharge current, (A)	Time for discharging, (hours)	Results
Supplementary information: - No explosion and no fire.				

Appendix 1

Photo Documentation



---End of Test Report---