



中国认可
检验
INSPECTION
CNAS IB0078

危险物品
DANGEROUS GOODS

航空运输危险性鉴别报告

Identification and Classification Report for Air Transport of Goods

此报告本年度有效
有效期至2025年12月31日

报告编号: PEKGZ202505094928WY200001

Issued No.:

生效日期: 2025. 05. 09

Effective Date:

委托单位: 苏州新亚电通股份有限公司

Applicant: Suzhou Xinya Electric Communication Co., Ltd

物品名称: 不可充电锂电池 CR2032 3.0V 225mAh

Name of Goods: Non Rechargeable Lithium-ion Battery CR2032 3.0V 225mAh

北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.



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The report is issued by DGM China according to IATA *Dangerous Goods Regulations* published in the current year and the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要，本公司要求委托人提供真实、完整的样品及资料。

According to the demand of identification and classification, DGM China requires the applicant to provide true and exact sample and data of the goods.

3. 委托人保证申报的物品和/或提供的样品与交运的货物是同一种物质。

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This report is only valid within the year in which the IATA *Dangerous Goods Regulations* is effective.

地址：北京首都国际机场货运北路天竺综合保税区BGS货运楼249室

邮编：101300

电话：010-69479673

传真：010-69479621

网址：www.dgmchina.com.cn

E-mail: test@dgmchina.com.cn





项目编号 Item No.		PEKGZ202505094928			
物品名称 Name of Goods	中文 Chinese	不可充电锂电池 CR2032 3.0V 225mAh			
	英文 English	Non Rechargeable Lithium-ion Battery CR2032 3.0V 225mAh			
鉴别结论 Conclusions		该物品为锂金属/合金电芯，单独包装。锂含量为0.0675克。已通过 UN38.3 测试，已通过包装件1.2米跌落试验，包装件通过3米堆码试验，每个包装件上均有电池标记。 参考有关资料，根据DGR有关规定，该物质分类识别为第9类（或项）危险品，UN3090。 This goods is lithium metal/alloy cell,packed individually.The lithium content is 0.0675g.Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3,Each package is capable of withstanding a 1.2m drop test in any orientation without damage to the cells contained therein, without shifting of the contents so as to allow cell to cell contact and without release of contents,The package is capable of withstanding the 3m stack test,Each package is marked with battery mark. According to IATA DGR this substance is classified as dangerous goods Class (or division) 9,UN3090.			
运输危险性 建议 Suggestion for Transport	UN/ID 编号 UN/ID No.	运输专用名称 Proper Shipping Name		类或项 Class or Div. (次要危险性) (Subsidiary Risk)	包装等级 Packing Group
	UN3090	Lithium metal batteries		9	/
	包装说明 Packing Inst.	客货机 Passenger and Cargo Aircraft	Forbidden		
		仅限货机 Cargo Aircraft only	968 IB		
	注意事项 Remarks	本物品仅限货机运输。 The goods can be transported on cargo aircraft only.			
主检员 Prepared by: 王义 审核人 Checked by: 梁建 批准人 Approved by: 孙延伟 报告单位 Stamp: 北京迪捷姆空运技术开发有限公司					

制单：王义



北京迪捷姆空运技术开发有限公司

项目编号: PEKGZ202505094928

物品名称: 不可充电锂电池 CR2032 3.0V 225mAh

电池/电芯 Battery / Cell:



包装件 Package:



锂电池/钠离子电池 UN38.3 试验概要 Test Summary

项目编号: PEKGZ202505094928

单位信息 Company Information					
委托单位 Consignor	苏州新亚电通股份有限公司/Suzhou Xinya Electric Communication Co., Ltd 江苏省苏州市相城区如元路 98 号 No.98, Ruyuan Road, XiangCheng, Suzhou City, JiangSu 电话/Tel: 13372179031 邮箱/Mail: jinlan.chen@xya-cn.com				
生产单位 Manufacturer	PT.Panasonic Gobel Energy Indonesia Jl. Teuku Umar Km. 44, Cikarang Barat Bekasi, Jawa Barat - Indonesia 电话/Tel: 021-38552000 邮箱/Mail: sunyongze@cn.panasonic.com				
测试单位 Test Lab	深圳诚测检测技术有限公司/Shenzhen CCJC Technology Co., Ltd 广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101 (1-3 层) 1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China 电话/Tel: 0755-23707853 邮箱/Mail: lab@ccjctek.com 网址/Website: www.ccjctek.com				
电池信息 Battery Information					
名称 Name	不可充电锂电池 Non Rechargeable Lithium-ion Battery	电池/电芯类别 Battery/Cell Classification		锂金属电芯 Lithium Metal Cell	
型号 Type	CR2032	商标 Trademark		/	
额定电压 Normal Voltage	3.0V	额定容量 Rated Capacity		225mAh	
额定能量 Watt-hour rating	不适用 N/A	外观 Appearance		黄色扣式 Yellow Button	
质量/Mass	3.45g	锂含量/Li Content		0.0675g	
测试信息 Test Information					
测试报告编号 Test Report Number	CCJC2512701R01		测试报告签发日期 Date of Test Report		2025-04-30
测试标准 Edition of UN Manual of Tests and Criteria Used	联合国《试验和标准手册》(第 8 版) 38.3 节 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3				
T.1: 高度模拟 Altitude Simulation	通过 Pass	T.2: 温度试验 Thermal Test	通过 Pass	T.3: 振动 Vibration	通过 Pass
T.4: 冲击 Shock	通过 Pass	T.5: 外部短路 External Short Circuit	通过 Pass	T.6: 撞击/挤压 Impact/Crush	通过 Pass
T.7: 过度充电 Overcharge	不适用 N/A	T.8: 强制放电 Forced Discharge	通过 Pass		
UN38.3.3.1(f)或/or UN38.3.3.2(d)	不适用 N/A		UN38.3.3.1(g) 或 /or UN38.3.3.2(e)		不适用 N/A
签名 Signatory	刘桂雄 Liu GuiXiong		签发日期 Issued Date		2025-05-09
职务 Title	检验员 Inspector: 刘桂雄 Liu GuiXiong				



1.2 米跌落测试报告

1.2m Drop Test Report

报告编号
Report No.

CCJC2512701R03

样品名称
Sample name

不可充电锂电池
Non Rechargeable Lithium-ion Battery

型号
Model

CR2032

申请商
Applicant

苏州新亚电通股份有限公司
Suzhou Xinya Electric Communication Co., Ltd

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

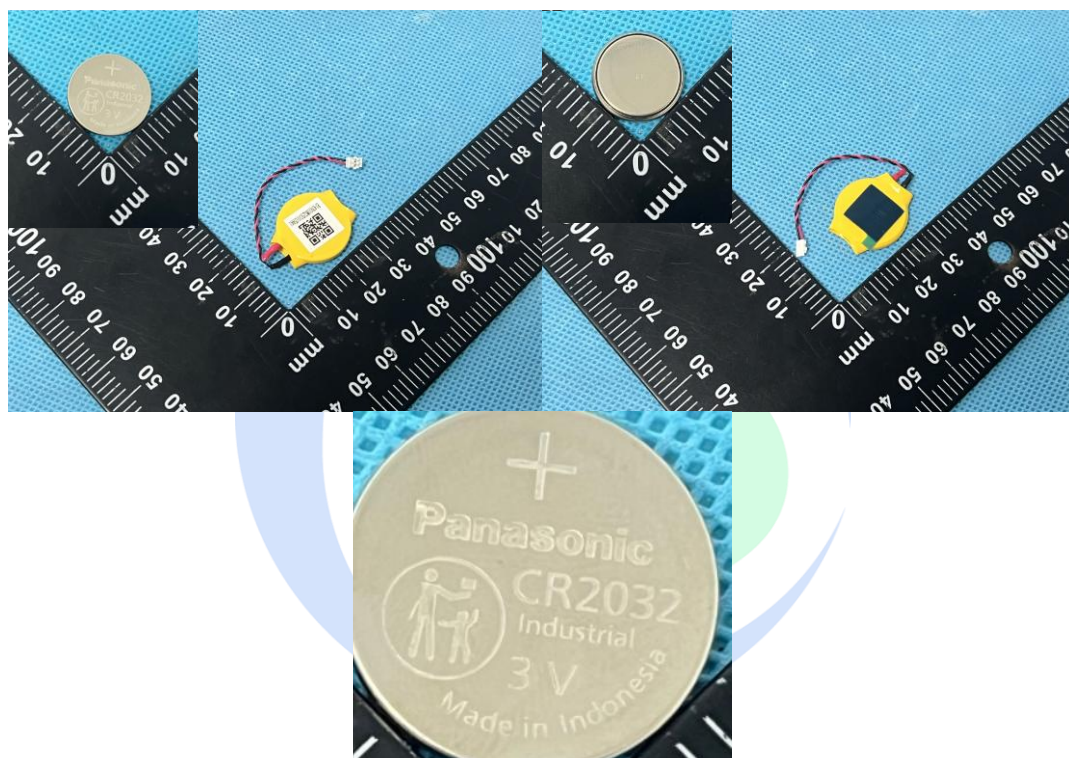
样品名称 Sample name	不可充电锂电池 Non Rechargeable Lithium-ion Battery	样品型号 Sample Model	CR2032
申请商 Applicant	苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd		
制造商 Manufacturer	PT.Panasonic Gobel Energy Indonesia		
生产厂 Factory	PT.Panasonic Gobel Energy Indonesia		
标称电压 Normal Voltage	3.0V	额定容量 Rated Capacity	225mAh
包装件尺寸 Package Dimensions	430*330*280(mm)	包装件电池净重 Net weight of batteries	2.49kg
电池数量 Battery Number	720pcs	整箱重量 Gross Weight	6.2kg
测试标准 Test Standard	联合国《关于危险货物运输的建议书 规章范本》(23 修订版)特殊规定 188 条款 UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(23 rd Rev. edition) special provisions 188		
接收日期 Accepted date	2025-03-31	检测日期 Test date	2025-04-30
测试项目 Test items	1.2m 跌落试验、包装件毛重测试 1.2m Drop test, Gross Weight Measure		
测试结论 Conclusion	被测试包装件能够承受 1.2 米跌落试验, 其内装的电池没有破损, 没有产生导致内装电池的直接接触的移动及内容物泄露, 该包装件总重量为 6.2kg (毛重)。 The tested package is capable of withstanding a 1.2m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery or cell to cell contact and without release of contents. The weight of the package is 6.2kg (gross mass)		
主检人: 陈天文 Tested by: 测试工程师 Test Engineer 批准人: 陈东 Approved by: 技术负责人 Technical Manager 审核人: 陈东 Inspected by: 项目工程师 Project Engineer 签发日期: 2025-04-30 Date of Issue:			

序号 No.	测试项目名称 Name of test	标准要求或标准 条款号 Standard requirement or the clause number of standard	测试结果 Test result		本项结论 Test conclusion	备注 Remark
1	1.2m 跌落试验 1.2m Drop test	联合国《关于危险货物 运输的建议书 规章范 本》(23 修订版)特殊规 定 188 条款 UNITED NATIONS “Recommendations on the TRANSPORT OF DANGEROUS GOODS” Model Regulations(23 rd Rev. edition) special provisions 188	面 跌 落	包装未破裂，内装物 完好。 The package is not cracked, the contents are not damaged and not shifted	合格 Passed	/
			棱 跌 落	包装未破裂，内装物 完好。 The package is not cracked, the contents are not damaged and not shifted		
			角 跌 落	包装未破裂，内装物 完好。 The package is not cracked, the contents are not damaged and not shifted		
2	包装件毛重测试 Gross Weight Measure	联合国《关于危险货物 运输的建议书 规章范 本》(23 修订版)特殊规 定 188 条款 UNITED NATIONS “Recommendations on the TRANSPORT OF DANGEROUS GOODS” Model Regulations(23 rd Rev. edition) special provisions 188	6.2kg		合格 Passed	/
测试环境条件 Test environment condition		环境温度：20°C-25°C；环境湿度：45%-75% Ambient temperature: 20°C-25°C; Ambient humidity: 45%-75%				

包装 Package:



电池 Battery:



声 明

Statement

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The client should provide samples and relevant data, otherwise we will not bear any relevant responsibilities.

测试实验室.....:	深圳诚测检测技术有限公司
Testing Laboratory.....:	Shenzhen CCJC Technology Co., Ltd
地址.....:	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101（1-3 层）
Address.....:	1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
电话 Tel.....:	0086-755-23707853
邮箱 Mail.....:	lab@ccjctek.com
网址 Website.....:	www.ccjctek.com

海运
By Sea

运输危险性鉴别报告书

Identification and Classification Report for Transport of Goods

危险物品
(Dangerous Goods)

报告编号
Report No.

CCJC2512701R05

样品名称
Sample name

不可充电锂电池
Non Rechargeable Lithium-ion Battery

型号
Model

CR2032

申请商
Applicant

苏州新亚电通股份有限公司
Suzhou Xinya Electric Communication Co., Ltd

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

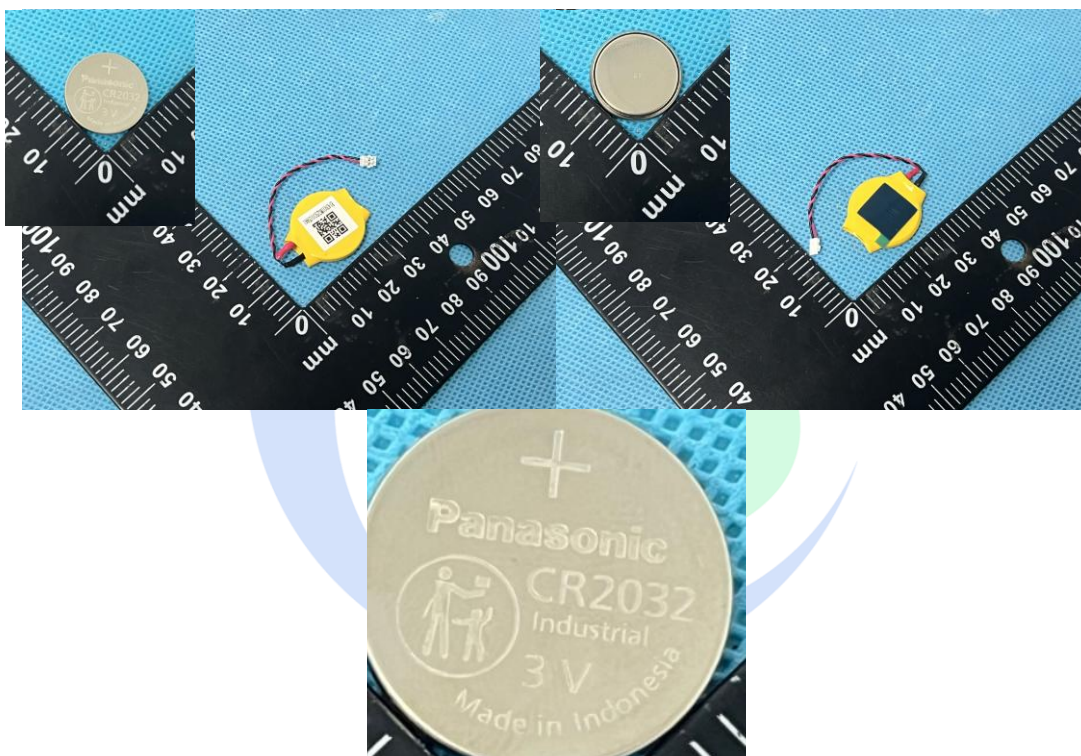
货物名称 Goods name	中文 Chinese	不可充电锂电池 CR2032			
	英文 English	Non Rechargeable Lithium-ion Battery CR2032			
申请商 Applicant		苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd			
制造商 Manufacturer		PT.Panasonic Gobel Energy Indonesia			
生产厂 Factory		PT.Panasonic Gobel Energy Indonesia			
鉴别依据 Identification Criteria		《国际海运危险货物规则》(42-24 版) International Maritime Dangerous Goods Code (Amdt.42-24)			
样品外观 Appearance		黄色扣式, 尺寸 $\Phi 22.63\text{mm} \times 4.61\text{mm}$ Yellow Button, size $\Phi 22.63\text{mm} \times 4.61\text{mm}$			
包装信息 Package information		电池数量 Battery number	720pcs	电池净重 Net weight of batteries	2.49kg
电池信息 Battery information		类型 Type	锂金属电芯 Lithium metal Cell	型号 Model	CR2032
		放置方式 Placement	只有电芯 Cell only	锂含量 Lithium content	0.0675g
鉴别结论 Conclusions		危险物品(Dangerous Goods)			
		UN编号(UN No.):		UN3090	
		运输专用名称(PSN)		Lithium metal batteries	
		危险性类别(Class or Div.)		9	
		包装等级(PG)		/	
备注 Comment		包装必须达到II级包装的性能标准。 Packagings must meet Packing Group II performance standard.			
接收日期 Accepted date	2025-03-31	检验日期 Inspection Date	2025-04-30	生效日期 Effective Date	2025-04-30
主检人: Tested by:		陈天文		批准人: Approved by:	
职位 Position:		测试工程师 Test Engineer		职位 Position:	
审核人: Inspected by:		陈强		签发日期: Date of Issue:	
职位 Position:		项目工程师 Project Engineer		2025-04-30	
				技术负责人 Technical Manager	

序号 No.	检查结果及其他事项 Inspection results and other things
1	本报告所述锂电池按照《国际海运危险货物规则》(42-24版) 2.9.4.5规定的质量管理体系进行制造。 Lithium cells and batteries listed in this report were manufactured under the quality management programme as described in IMDG CODE 42-24 EDITION 2.9.4.5.
2	本报告所述锂电池已通过《联合国试验和标准手册》第III部分38.3 小节相应测试要求。 包装件能够承受1.2m跌落试验。 Lithium cells and batteries listed in this report are of the types proven to meet the requirements of each applicable test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3. The package has passed the 1.2m drop test.
3	锂电池完全封装在内包装内，位于坚固的外包装中。 Lithium cells and batteries are packed in inner packagings that completely enclose the cell or battery and placed in a strong outer packaging.
4	电池具有适当的防短路措施。 Cells and batteries are properly protected to prevent short circuits.
5	每个包装件必须标示恰当的锂电池标记。 Each package shall be marked with the appropriate lithium battery mark.
6	/
7	/

包装件 Package:



电池 Battery:



声 明

Statement

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3. 委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to CCJC within 15 days.

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The client should provide samples and relevant data, otherwise we will not bear any relevant responsibilities.

测试实验室.....:	深圳诚测检测技术有限公司
Testing Laboratory.....:	Shenzhen CCJC Technology Co., Ltd
地址.....:	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101（1-3 层）
Address.....:	1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
电话 Tel.....:	0086-755-23707853
邮箱 Mail.....:	lab@ccjctek.com
网址 Website.....:	www.ccjctek.com

UN38.3 测试报告

UN38.3 Test Report

报告编号 Report No.	CCJC2512701R01
样品名称 Sample name	不可充电锂电池 Non Rechargeable Lithium-ion Battery
型号 Model	CR2032
申请商 Applicant	苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

申请商 Applicant	名称 Name	苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd		
	地址 Address	江苏省苏州市相城区如元路 98 号 No.98, Ruyuan Road, XiangCheng, Suzhou City, JiangSu		
制造商 Manufacturer	名称 Name	PT.Panasonic Gobel Energy Indonesia		
	地址 Address	Jl. Teuku Umar Km. 44, Cikarang Barat Bekasi, Jawa Barat - Indonesia		
	电话 Tel: 021-38552000		邮箱 Mail: sunyongze@cn.panasonic.com	
	网址 Website: /			
生产厂 Factory	名称 Name	PT.Panasonic Gobel Energy Indonesia		
	地址 Address	Jl. Teuku Umar Km. 44, Cikarang Barat Bekasi, Jawa Barat - Indonesia		
测试实验室 Testing Laboratory	名称 Name	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co., Ltd		
	地址 Address	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101 (1-3 层) 1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China		
	电话 Tel: 0086-755-23707853		邮箱 Mail: lab@ccjctek.com	
	网址 Website: www.ccjctek.com			
测试标准 Test Standard	联合国《试验和标准手册》(第 8 版) 38.3 节 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3			
接收日期 Accepted date	2025-04-10		测试日期 Test date	2025-04-10 ~ 2025-04-30
测试项目 Test items	高度模拟、温度试验、振动、冲击、外部短路、挤压、强制放电。 Altitude simulation, Thermal test, Vibration, Shock, External short circuit, Crush, Forced discharge.			
测试结论 Conclusion	经测试, 样品符合联合国《试验和标准手册》(第 8 版) 38.3 节标准要求。 The sample has passed the test items of UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/ Subsection 38.3.			
主检人: Tested by: <u>陈天文 Tianwen Chen</u> 职位 Position: 测试工程师 Test Engineer 审核人: Inspected by: <u>陈聪 Cong chen</u> 职位 Position: 项目工程师 Project Engineer 批准人: Approved by: <u>程鹏 Roc Cheng</u> 职位 Position: 技术负责人 Technical Manager 签发日期: Date of Issue: 2025-04-30				

基本信息 General Information:															
产品名称	不可充电锂电池														
Product name	Non Rechargeable Lithium-ion Battery														
型号参数															
Model and Parameters	CR2032, 3.0V, 225mAh, 锂含量 lithium content 0.0675g														
商标															
Trade Mark.....	/														
技术参数 Technical Parameters:															
	电池 Cell														
型号 Model	CR2032														
形状 Shape	扣式 Button														
标称电压 Nominal Voltage	3.0V														
额定容量 Rated Capacity	225mAh														
锂含量 Lithium content	0.0675g														
标准放电电流 Standard Discharge Current	0.2mA														
最大持续放电电流 Max. Continuous Discharge Current	2mA														
放电终止电压 Discharge Cut-off Voltage	2.0V														
<table border="1"> <thead> <tr> <th>测试项目 Test items</th> <th>样品编号 Sample Number</th> </tr> </thead> <tbody> <tr> <td>T.1: 高度模拟 Altitude simulation</td> <td rowspan="5">C01 – C20</td> </tr> <tr> <td>T.2: 温度测试 Thermal test</td> </tr> <tr> <td>T.3: 振动 Vibration</td> </tr> <tr> <td>T.4: 冲击 Shock</td> </tr> <tr> <td>T.5: 外短路 External short circuit</td> </tr> <tr> <td>T.6: 挤压 Crush or 撞击 Impact</td> <td>C21 – C30</td> </tr> <tr> <td>T.7: 过充电 Overcharge</td> <td>N/A</td> </tr> <tr> <td>T.8: 强制放电 Forced discharge</td> <td>C31 – C40</td> </tr> </tbody> </table>		测试项目 Test items	样品编号 Sample Number	T.1: 高度模拟 Altitude simulation	C01 – C20	T.2: 温度测试 Thermal test	T.3: 振动 Vibration	T.4: 冲击 Shock	T.5: 外短路 External short circuit	T.6: 挤压 Crush or 撞击 Impact	C21 – C30	T.7: 过充电 Overcharge	N/A	T.8: 强制放电 Forced discharge	C31 – C40
测试项目 Test items	样品编号 Sample Number														
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T.5: 外短路 External short circuit															
T.6: 挤压 Crush or 撞击 Impact	C21 – C30														
T.7: 过充电 Overcharge	N/A														
T.8: 强制放电 Forced discharge	C31 – C40														
样品状况良好。 The sample's status is good.															

测试步骤:
Test Procedure:

1. 小型电池或电池组应按顺序进行试验 T.1 至 T.5。试验 T.6 和 T.8 应使用未另外试验过的电池或电池组。试验 T.7 可以使用原先在试验 T.1 至 T.5 中使用过的未损坏电池组进行，以便测试经过充放电的电池组。

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells or batteries. Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries..

2. 为了量化质量损失，可用以下公式计算：质量损失(%)=(M₁-M₂)/M₁×100

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss(\%)} = (M_1 - M_2) / M_1 \times 100$$

式中：M₁ 是试验前的质量，M₂ 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

Where M₁ is the mass before the test and M₂ is the mass after the test. When mass loss does not exceed the values in Table below, it is considered as "no mass loss".

电芯或电池的质量 Mass M of cell or battery	质量损失限值 Mass loss limit
M<1g	0.5%
1g≤M≤75g	0.2%
M>75g	0.1%

3. 在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

In test T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure.

4. 备注 Remark:

测试判定： Possible test case verdicts:	
判定不适用于测试对象 Test case does not apply to the test object	N/A
测试符合规定 Test object does meet the requirement	P (Pass)
测试不符合规定 Test object does not meet the requirement.....	F (Fail)

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.1	Test T.1: 高度模拟/Altitude simulation		P
	试验电池和电池组应在压力等于或低于 11.6 千帕和环境温度 (20°C±5°C) 下存放至少 6 小时。 Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C)		P
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.1。 The data see table 38.3.4.1.	P
38.3.4.2	Test T.2: 温度试验/Thermal test		P
	试验电池和电池组应先在试验温度等于 72°C±2°C 的条件下存放至少 6 小时, 接着再在试验温度等于 -40°C±2°C 的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行, 共完成 10 次, 接着将所有试验电池和电池组在环境温度 (20°C±5°C) 下存放 24 小时。 Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to - 40±2°C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20 ±5°C).		P
	对于大型电池和电池组, 暴露于极端试验温度的时间至少应为 12 小时。 For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.		N/A
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.2。 The data see table 38.3.4.2.	P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.3	Test T.3: 振动/Vibration		P
	电池和电池组紧固于振动机平台，但紧固程度不能造成电池变形以致不能准确传递振动。振动应是正弦波形，对数频率扫描从 7 赫兹到 200 赫兹，再回到 7 赫兹，跨度为 15 分钟。这一振动过程须对三个互相垂直的电池安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。 Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.		P
	作对数式频率扫描，对总质量不足 12 千克的电池和电池组(电池和小型电池组)，和对 12 千克及更大的电池组(大型电池组)应有所不同。 The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).		P
	对电池和小型电池组：从 7 赫兹开始，保持 1 gn 的最大加速度，直到频率达到 18 赫兹。然后将振幅保持在 0.8 毫米(总偏移 1.6 毫米)，并增加频率直到最大加速度达到 8 gn(频率约为 50 赫兹)。将最大加速度保持在 8 gn 直到频率增加到 200 赫兹。 For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.		P
	对大型电池组：从 7 赫兹开始，保持 1 gn 的最大加速度，直到频率达到 18 赫兹。然后将振幅保持在 0.8 毫米(总偏移 1.6 毫米)，并增加频率直到最大加速度达到 2 gn(频率约为 25 赫兹)。将最大加速度保持在 2 gn 直到频率增加到 200 赫兹。 For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.		N/A

UN 38.3												
Clause	Requirement + Test	Result - Remark	Verdict									
	电池和电池组试验中和试验后无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组在第三个垂直安装方位上的试验后立即测得的开路电压不小于在进行这一试验前电压的 90%，电池和电池组即符合本项要求。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position is not less than 90 % of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.3。 The data see table 38.3.4.3.	P									
38.3.4.4	Test T.4: 冲击/Shock		P									
	试验电池和电池组用坚硬支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。 Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.		P									
	每个电池必须经受最大加速度 150g_n和脉冲持续时间 6 毫秒的半正弦波冲击。针对大型电池必须经受最大加速度 50g_n和脉冲持续时间 11 毫秒的半正弦波冲击。 Each cell shall be subjected to a half-sine shock of peak acceleration of 150g_n and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50g_n and pulse duration of 11 milliseconds		P									
	每个电池组须经受的正弦波冲击的最大加速度取决于电池组的质量。小型电池组的脉冲持续时间 6 毫秒，大型电池组的脉冲持续时间 11 毫秒。以下公式用于计算合适的最低限度最大加速度。 Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations. <table><tr><th>Battery</th><th>Minimum peak acceleration</th><th>Pulse duration</th></tr><tr><td>Small batteries</td><td>150 g_n or result of formula $Acceleration(g_n) = \sqrt{\frac{100850}{mass *}}$ whichever is smaller</td><td>6 ms</td></tr><tr><td>Large batteries</td><td>50 g_n or result of formula $Acceleration(g_n) = \sqrt{\frac{30000}{mass *}}$ whichever is smaller</td><td>11 ms</td></tr></table> * Mass is expressed in kilograms.	Battery	Minimum peak acceleration	Pulse duration	Small batteries	150 g _n or result of formula $Acceleration(g_n) = \sqrt{\frac{100850}{mass *}}$ whichever is smaller	6 ms	Large batteries	50 g _n or result of formula $Acceleration(g_n) = \sqrt{\frac{30000}{mass *}}$ whichever is smaller	11 ms		N/A
Battery	Minimum peak acceleration	Pulse duration										
Small batteries	150 g _n or result of formula $Acceleration(g_n) = \sqrt{\frac{100850}{mass *}}$ whichever is smaller	6 ms										
Large batteries	50 g _n or result of formula $Acceleration(g_n) = \sqrt{\frac{30000}{mass *}}$ whichever is smaller	11 ms										

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	每个电池或电池组须在三个互相垂直的电池或电池组安装方位的正极方向经受三次冲击，接着在负极方向经受三次冲击，总共经受 18 次冲击。 Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.		P
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. / 测试数据见表 38.3.4.4。 The data see table 38.3.4.4.	P
38.3.4.5	Test T.5: 外部短路/External short circuit		P
	对于待试电池或电池组，应加温一段必要的时间，使从外壳测量的温度达到均匀的稳定温度 $57 \pm 4^{\circ}\text{C}$。这段时间的长短取决于电池或电池组的大小和设计，对于这个持续时间应加以评估和记录。如无法进行这种评估，则小型电池和小型电池组的暴露时间应至少 6 小时，大型电池和小型电池组的暴露时间应至少 12 小时。然后，电池或电池组应在 $57 \pm 4^{\circ}\text{C}$ 条件下经受总外电阻小于 0.1 欧姆的短路条件。 The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of $57 \pm 4^{\circ}\text{C}$, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at $57 \pm 4^{\circ}\text{C}$ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.		P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	这一短路条件应在电池或电池组外壳温度回到 $57\pm4^{\circ}\text{C}$ 后继续至少 1 小时，或在大型电池组的情况下外壳温度降幅达试验中所观察的最高温升幅的二分之一并保持低于该数值。 短路和降温阶段的温度应至少相当于环境温度。 This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm4^{\circ}\text{C}$, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value. The short circuit and cooling down phases shall be conducted at least at ambient temperature.		P
	电池和电池组外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体，无破裂，无起火。 Cells and batteries meet this requirement if their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.	在测试过程中以及之后 6 个小时内，外表温度不超 170°C，并且无解体，无破裂，无起火现象发生。 Their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after the test. 测试数据见表 38.3.4.5。 The data see table 38.3.4.5.	P
38.3.4.6	Test T.6: 撞击/挤压/Impact / Crush		P
	撞击(适合于直径大于或等于 18mm 的圆柱形电芯) Test procedure – Impact (applicable to cylindrical cells greater than or equal to 18 mm in diameter)	纽扣电芯/Coin cell	N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	试样电池或元件电池放在平坦光滑的表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米 ± 0.1 毫米，长度至少 6 厘米，或电池最长端的尺度，取二者之长者。将一块 9.1 千克 ± 0.1 千克的重锤从 61 ± 2.5 厘米高处跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90 度落下。 The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm±0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg±0.1 kg mass is to be dropped from a height of 61±2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.		N/A
	接受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 15.8 ±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。 The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm±0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.		N/A
	挤压（适用于棱柱形、袋装、硬币/纽扣电池和直径小于 18 毫米的圆柱形电池） Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18 mm in diameter).	纽扣电芯/Coin cell	P
	将电池或元件电池放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 厘米/秒。挤压持续进行，直到出现以下三种情况之一。 A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.		P
	(a) 施加力达到 13kN±0.78kN (a) The applied force reaches 13kN±0.78kN		P
	(b) 样品的电压下降至少 100mV (b) The voltage of the cell drops by at least 100 mV		N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	(c) 电池变形达原始厚度的 50%以上。 (c)The cell is deformed by 50% or more of its original thickness.		N/A
	棱柱形或袋装电池应从最宽的一面施压。纽扣/硬币形电池应从其平坦表面施压。圆柱形电池应从与纵轴垂直的方向施压。 A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.		P
	每个试样电池或元件电池只做一次挤压试验。试样应继续观察 6 小时。试验应使用之前未做过其他试验的电池或元件电池进行。 Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.		P
	电芯满足要求：在测试过程中以及之后 6 个小时内，外表温度不超过 170°C，并且无解体和无起火现象发生。 Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after this test.	无解体，无起火现象发生。 No disassembly and no fire. 测试数据见表 38.3.4.6。 The data see table 38.3.4.6.	P
38.3.4.7	Test T.7: 过充电/Overcharge		N/A
	充电电流必须是制造商建议的最大持续充电电流的两倍。试验的最小电压如下： The charge current shall be twice the manufacturer's recommended maximum continuous charge current. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The minimum voltage of the test shall be as follows:		N/A
	(a) 制造商建议的充电电压不大于 18 伏时，试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者 (a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.		N/A
	(b) 制造商建议的充电电压大于 18 伏时，试验的最小电压应为最大充电电压的 1.2 倍。 (b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.		N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	充电电池组在试验过程中和试验后 7 天内无解体，无起火。 Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.		N/A
38.3.4.8	Test T.8: 强制放电/Forced discharge		P
	每个电池应在环境温度下与 12 伏直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。 Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.		P
	将适当大小和额定值的电阻负荷与试验电池串联，计算得出给定的放电电流。对每个电池进行强制放电，放电时间（小时）应等于其额定容量除以初始试验电流（安培）。 The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).		P
	原电池或充电电池在试验过程中和试验后 7 天内无解体，无起火 Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.	无解体，无起火现象发生。 No disassembly and no fire. 测试数据见表 38.3.4.8 The data see table 38.3.4.8.	P

TABLE: 38.3.4.1		高度模拟 Altitude simulation					P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Undischarged							
C01	3.430	3.24	3.430	3.24	0.000	0.00	P
C02	3.436	3.23	3.436	3.23	0.000	0.00	P
C03	3.437	3.22	3.437	3.22	0.000	0.00	P
C04	3.443	3.24	3.443	3.24	0.000	0.00	P
C05	3.435	3.23	3.435	3.23	0.000	0.00	P
C06	3.452	3.24	3.452	3.24	0.000	0.00	P
C07	3.423	3.22	3.423	3.22	0.000	0.00	P
C08	3.438	3.23	3.437	3.23	0.029	0.00	P
C09	3.423	3.24	3.423	3.24	0.000	0.00	P
C10	3.438	3.23	3.438	3.23	0.000	0.00	P
Fully discharged							
C11	3.429	--	3.429	--	0.000	--	P
C12	3.433	--	3.433	--	0.000	--	P
C13	3.432	--	3.431	--	0.029	--	P
C14	3.428	--	3.428	--	0.000	--	P
C15	3.441	--	3.441	--	0.000	--	P
C16	3.435	--	3.435	--	0.000	--	P
C17	3.431	--	3.431	--	0.000	--	P
C18	3.432	--	3.431	--	0.029	--	P
C19	3.438	--	3.438	--	0.000	--	P
C20	3.442	--	3.442	--	0.000	--	P

TABLE: 38.3.4.2		温度试验 Thermal test					P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Undischarged							
C01	3.430	3.24	3.427	3.24	0.087	0.00	P
C02	3.436	3.23	3.434	3.23	0.058	0.00	P
C03	3.437	3.22	3.435	3.23	0.058	-0.31	P
C04	3.443	3.24	3.441	3.24	0.058	0.00	P
C05	3.435	3.23	3.432	3.24	0.087	-0.31	P
C06	3.452	3.24	3.450	3.24	0.058	0.00	P
C07	3.423	3.22	3.421	3.22	0.058	0.00	P
C08	3.437	3.23	3.435	3.24	0.058	-0.31	P
C09	3.423	3.24	3.421	3.24	0.058	0.00	P
C10	3.438	3.23	3.435	3.23	0.087	0.00	P
Fully discharged							
C11	3.429	--	3.427	--	0.058	--	P
C12	3.433	--	3.431	--	0.058	--	P
C13	3.431	--	3.429	--	0.058	--	P
C14	3.428	--	3.426	--	0.058	--	P
C15	3.441	--	3.438	--	0.087	--	P
C16	3.435	--	3.433	--	0.058	--	P
C17	3.431	--	3.429	--	0.058	--	P
C18	3.431	--	3.429	--	0.058	--	P
C19	3.438	--	3.435	--	0.087	--	P
C20	3.442	--	3.440	--	0.058	--	P

TABLE: 38.3.4.3		振动 Vibration					P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Undischarged							
C01	3.427	3.24	3.427	3.24	0.000	0.00	P
C02	3.434	3.23	3.434	3.23	0.000	0.00	P
C03	3.435	3.23	3.435	3.22	0.000	0.31	P
C04	3.441	3.24	3.441	3.24	0.000	0.00	P
C05	3.432	3.24	3.432	3.24	0.000	0.00	P
C06	3.450	3.24	3.450	3.24	0.000	0.00	P
C07	3.421	3.22	3.421	3.22	0.000	0.00	P
C08	3.435	3.24	3.435	3.23	0.000	0.31	P
C09	3.421	3.24	3.420	3.24	0.029	0.00	P
C10	3.435	3.23	3.435	3.23	0.000	0.00	P
Fully discharged							
C11	3.427	--	3.427	--	0.000	--	P
C12	3.431	--	3.430	--	0.029	--	P
C13	3.429	--	3.429	--	0.000	--	P
C14	3.426	--	3.426	--	0.000	--	P
C15	3.438	--	3.437	--	0.029	--	P
C16	3.433	--	3.433	--	0.000	--	P
C17	3.429	--	3.429	--	0.000	--	P
C18	3.429	--	3.429	--	0.000	--	P
C19	3.435	--	3.435	--	0.000	--	P
C20	3.440	--	3.440	--	0.000	--	P

TABLE: 38.3.4.4		冲击 Shock					P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Undischarged							
C01	3.427	3.24	3.426	3.24	0.029	0.00	P
C02	3.434	3.23	3.434	3.23	0.000	0.00	P
C03	3.435	3.22	3.435	3.22	0.000	0.00	P
C04	3.441	3.24	3.441	3.24	0.000	0.00	P
C05	3.432	3.24	3.432	3.23	0.000	0.31	P
C06	3.450	3.24	3.450	3.24	0.000	0.00	P
C07	3.421	3.22	3.421	3.22	0.000	0.00	P
C08	3.435	3.23	3.435	3.23	0.000	0.00	P
C09	3.420	3.24	3.420	3.24	0.000	0.00	P
C10	3.435	3.23	3.435	3.23	0.000	0.00	P
Fully discharged							
C11	3.427	--	3.427	--	0.000	--	P
C12	3.430	--	3.430	--	0.000	--	P
C13	3.429	--	3.429	--	0.000	--	P
C14	3.426	--	3.426	--	0.000	--	P
C15	3.437	--	3.437	--	0.000	--	P
C16	3.433	--	3.433	--	0.000	--	P
C17	3.429	--	3.429	--	0.000	--	P
C18	3.429	--	3.429	--	0.000	--	P
C19	3.435	--	3.435	--	0.000	--	P
C20	3.440	--	3.440	--	0.000	--	P

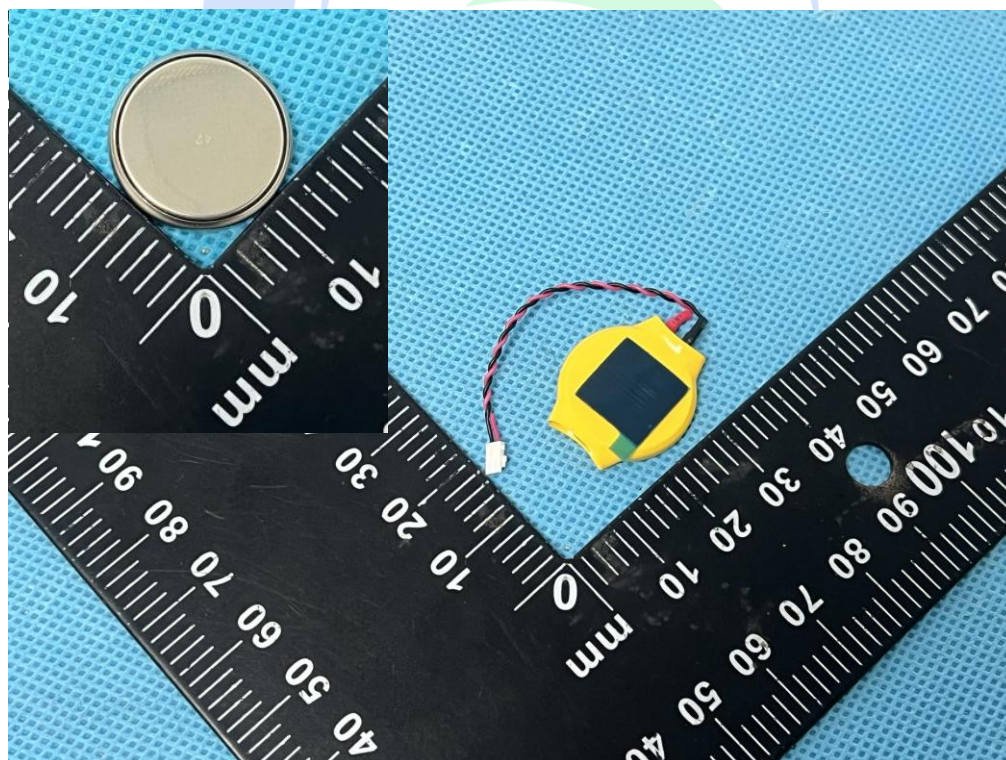
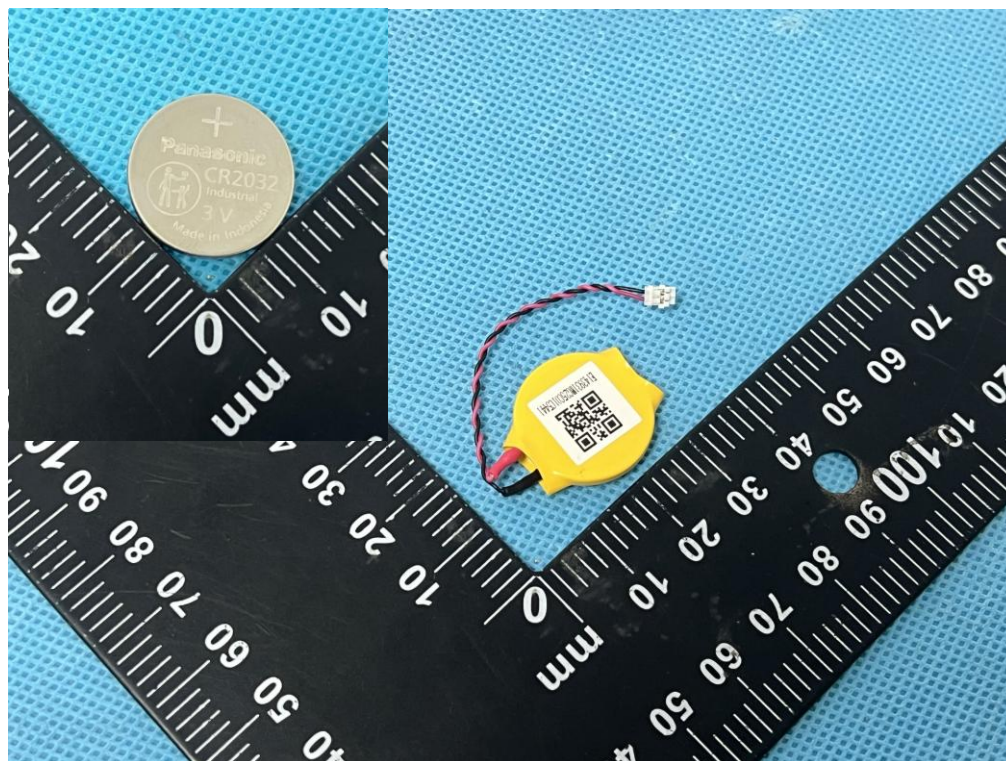
TABLE: 38.3.4.5		外部短路 External short circuit		P
Sample No.	Ambient (°C) (At 57±4°C)	Resistance of circuit (mΩ)	Maximum case temperature (°C)	Results
Undischarged				
C01	56.6	82.3	64.2	P
C02	56.5	90.2	65.1	P
C03	56.7	79.1	54.3	P
C04	56.9	82.9	65.2	P
C05	56.8	87.3	64.5	P
C06	56.7	88.4	65.1	P
C07	56.5	88.5	64.3	P
C08	56.6	84.6	64.6	P
C09	56.9	83.2	65.5	P
C10	56.5	79.3	64.7	P
Fully discharged				
C11	56.4	78.7	59.4	P
C12	56.8	81.2	59.8	P
C13	57.0	89.3	60.1	P
C14	56.7	84.5	59.2	P
C15	57.0	94.1	60.2	P
C16	56.7	82.9	59.8	P
C17	56.7	83.2	59.7	P
C18	56.9	92.5	60.3	P
C19	57.0	80.7	60.4	P
C20	56.6	85.3	60.2	P

TABLE: 38.3.4.6		撞击 Impact		N/A	
TABLE: 38.3.4.6		挤压 Crush		P	
Sample No.	Maximum case temperature (°C)	Results	Sample No.	Maximum case temperature (°C)	Results
Undischarged			Fully discharged		
C21	23.5	P	C26	23.3	P
C22	23.6	P	C27	23.5	P
C23	23.2	P	C28	23.2	P
C24	23.3	P	C29	23.3	P
C25	23.5	P	C30	23.4	P

TABLE: 38.3.4.8		强制放电 Forced discharge			P
Sample No.	OCV (V)	Results	Sample No.	OCV (V)	Results
Fully discharged					
C31	2.44	P	C36	2.46	P
C32	2.46	P	C37	2.45	P
C33	2.45	P	C38	2.45	P
C34	2.44	P	C39	2.46	P
C35	2.45	P	C40	2.44	P



电池照片 Cell photos



声 明

Statement

1. 本报告无本单位报告专用章和批准人签章无效。

This report is invalid without the special seal for report of CCJC and the signatures of approver.

2. 本报告涂改和删除无效。

This report is invalid if is blotted out and deleted.

3. 委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to CCJC within 15 days.

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The client should provide samples and relevant data, otherwise we will not bear any relevant responsibilities.

测试实验室.....:	深圳诚测检测技术有限公司
Testing Laboratory	Shenzhen CCJC Technology Co., Ltd
地址.....:	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101（1-3 层）
Address.....:	1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
电话 Tel	0086-755-23707853
邮箱 Mail	lab@ccjctek.com
网址 Website.....:	www.ccjctek.com

MSDS 报告

MSDS Report

申请商: Prepared For:	苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd		
地址: Address:	江苏省苏州市相城区如元路 98 号 No.98, Ruyuan Road, XiangCheng, Suzhou City, JiangSu		
产品名称: Product Name:	不可充电锂电池 Non Rechargeable Lithium-ion Battery		
型号: Model:	CR2032		
参数: Parameters:	3.0V, 225mAh, 锂含量 lithium content 0.0675g		
质量: Weight:	Approx(约). 3.45g		
尺寸: Dimension:	Φ22.63mm*4.61mm		
编制单位: Prepared By:	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co.,Ltd. 广东省深圳市宝安区松岗街道溪头社区溪头路25号厂房101 (1-3层) 1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China		
报告编号: Report No.:	CCJC2512701R02	接收日期: Accepted date:	2025-04-10
检验日期: Inspection Date:	2025-04-30	生效日期: Effective Date:	2025-04-30
主检人: Tested by:	陈天文 Tianwen Chen 测试工程师 Test Engineer	批准人: Approved by:	程鹏 Roc Cheng 技术负责人 Technical Manager
审核人: Inspected by:	陈聪 Cong chen 项目工程师 Project Engineer	签发日期: Date of Issue:	2025-04-30

Material Safety Data Sheet

第一部分 化学品及企业标识

Section 1 - Chemical Product and Company Identification

产品名称: <i>Product Name:</i>	不可充电锂电池 Non Rechargeable Lithium-ion Battery
产品型号 <i>Product Model:</i>	CR2032
制造商: <i>Manufacture:</i>	PT.Panasonic Gobel Energy Indonesia
地址: <i>Address:</i>	Jl. Teuku Umar Km. 44, Cikarang Barat Bekasi, Jawa Barat - Indonesia
电话: <i>Tel:</i>	+81-21-38552000
传真: <i>Fax:</i>	/
应急电话: <i>Emergency Tel:</i>	+81-21-38552000
邮箱: <i>E-mail:</i>	sunyongze@cn.panasonic.com

第二部分 危险性概述

Section 2 - Hazards Identification

危险性类别 <i>Classification of Danger</i>	见第十四部分。 See section 14.
侵入途径 <i>Primary Route(s) of Exposure</i>	眼睛，皮肤接触，摄入。 Eye, skin contact, ingestion.
健康危害 <i>Health Hazard</i>	正常条件下根据制造商的说明使用电池不会产生危害。使用不当的情况下，有破裂、起火、发烫、内部成分泄漏的危险，并可能造成意外损失。使用不当的行为包括但不限于下列情况：长时间充电、短路、投入火中、硬物撞击、尖物刺破、破碎，和破裂。 The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

第三部分 成分/组成信息

Section 3 – Composition/Information on Ingredients

化学名称 Chemical Composition	CAS 编号 CAS No.	浓度或浓度范围(%) Concentration or concentration ranges (%)
二氧化锰 Manganese dioxide	1313-13-9	12-50
金属锂 Lithium	7439-93-2	0.5-6
乙二醇二甲醚 1,2-Dimethoxyethane	110-71-4	1.5-3.5
高氯酸锂 Lithium perchlorate	7791-03-9	0.2-0.7
碳酸丙烯酯 Propylene carbonate	108-32-7	2.5-7
钢 Steel	12597-69-2	30-85
聚丙烯 Polypropylene	9003-07-0	0.5-10

标签根据EC指令。

Labeling according to EC directives.

不需要象形符号和危险短语。

No symbol and risk phrase are required.

注意: CAS 号是化学文摘服务注册号码。

Note: CAS number is Chemical Abstract Service Registry Number.

N/A = 不适用。

N/A = Not apply.

第四部分 急救措施

Section 4 - First Aid Measures

眼睛 Eye	万一接触，立即用大量的清水冲洗至少15 分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。 Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
皮肤 Skin	万一接触，用大量水冲洗至少15 分钟，同时除去污染的衣物和鞋子，迅速就医。 Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
吸入 Inhalation	立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。 Remove from exposure and move to fresh air immediately. Use oxygen if available.
食入 Ingestion	饮用至少两杯牛奶或水。如果当事人仍然清醒可以采取催吐的方法，并且立即就医。 Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

第五部分 消防措施

Section 5 - Fire Fighting Measures

危险特性 <i>Characteristics of Hazard</i>	高密度粉尘遇空气会形成爆炸性混合物。燃烧生成有毒烟雾。 Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
燃烧产生的危险物品 <i>Hazardous Combustion Products</i>	二氧化碳。 Carbon dioxide.
灭火方法及灭火剂 <i>Fire-extinguishing Methods and Extinguishing Media</i>	对于小型火险，可使用水枪，干冰（也就是液态二氧化碳）或化学泡沫。 For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
灭火注意事项 <i>Attention in Fire-extinguishing</i>	因为压强关系，要穿戴可呼吸式全身防护装备，MSHA/NIOSH（经认证或等效的），以及佩戴全套防护装置。 Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

第六部分 泄露应急处理

Section 6 - Accidental Release Measures

个人预防措施、防护装备和 应急程序 <i>Personal Precautions, protective equipment, and emergency procedures</i>	万一破裂。注意！腐蚀性物质。避免接触皮肤，眼睛或衣服。确保空气流通。根据需要使用个人防护装备。将人员撤离到安全区域。让人们远离溢出/泄漏处和处于逆风。参考第七部分和第八部分中列出的防护措施。 In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
环境保护措施 <i>Environmental Precautions</i>	防止产品污染土壤和进入下水道或水道。 Prevent product from contaminating soil and from entering sewers or waterways.
方法和材料控制 <i>Methods and materials for Containment</i>	出于安全，阻止泄漏，可以用干砂或泥土来遏制液体溢出，立即清理溢出物。 Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
清理的方法和材料 <i>Methods and materials for cleaning up</i>	用惰性吸收剂(干砂或泥土)吸收溢出的材料。污染物转移到可接受的废物容器中。收集所有受污染的吸收剂，按照第十三部分的说明进行处理。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤水，妥善处理。 Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

第七部分 操作处置与储存

Section 7 - Handling and Storage

操作 <i>Handling</i>	拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短路或将电池正负极错误的安装在设备中。 In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.
储存 <i>Storage</i>	储藏于阴凉，干燥，通风处，远离接触会发生反应的材料。存储锁定。放在儿童无法接触的地方。 Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.

其他要注意的防范措施 <i>Other Precautions</i>	万一破裂。按照良好的工业卫生和安全规范进行操作。避免接触皮肤，眼睛或衣服。使用个人防护设备。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.
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第八部分 接触控制和个体防护

Section 8 - Exposure Controls/Personal Protection

工程控制 <i>Engineering Controls</i>	保证空气流通使空气密度保持在低水平。如果在会生成微粒的情况下使用，应仔细观察 3mg/m³ ACGIH TLV-TWA 的吸入量（总量为 10mg/m³）。 Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m³ respirable fraction (10mg/m³ total) should be observed.
个人防护设备 <i>Personal Protective Equipment</i>	眼睛和脸部保护：消费者无需使用。如果有接触危险：密封安全护目镜。面部防护罩。 Eye and Face Protection: None required for consumer use. If there is a risk of contact: Tight sealing safety goggles. Face protection shield. 皮肤和身体防护：消费者无需使用。如果有接触危险：穿戴防护手套和防护服。 Skin and Body Protection: None required for consumer use. If there is a risk of contact: Wear protective gloves and protective clothing. 呼吸系统防护：正常使用条件下不需要防护设备。如果超过暴露限值或发生刺激，可能需要通风和疏散。 Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

第九部分 理化特性

Section 9 - Physical and Chemical Properties

物理状态 <i>Physical State</i>	外形：扣式 Appearance: Button
	颜色：黄色 Color: Yellow
	气味：泄漏时，医用乙醚的气味。 Odour: If leaking, smells of medical ether.
变化的条件： Change in condition	
酸碱度 pH	不适用。 Not applicable as supplied.
熔点/凝固点 Melting point/freezing point	不适用。 Not applicable as supplied.
沸点、初沸点和沸程 Initial boiling point and boiling range	不适用。 Not applicable as supplied.
闪点 Flash Point	不适用。 Not applicable as supplied.
爆炸极限 Explosion Limits	不适用。 Not applicable as supplied.

蒸气压 <i>Vapour pressure</i>	不适用。 Not applicable as supplied.
蒸气密度 <i>Vapor density</i>	不适用。 Not applicable as supplied.
密度/相对密度 <i>density/Relative density:</i>	不适用。 Not applicable as supplied.
溶解性 <i>Solubility</i>	不适用。 Not applicable as supplied.
n-辛醇/水分配系数 <i>Partition coefficient: n-octanol/water</i>	不适用。 Not applicable as supplied.
自燃温度 <i>Auto-ignition temperature</i>	不适用。 Not applicable as supplied.
分解温度 <i>Decomposition temperature</i>	不适用。 Not applicable as supplied.
气味阈值 <i>Odour threshold</i>	不适用。 Not applicable as supplied.
蒸发速率 <i>Evaporation rate</i>	不适用。 Not applicable as supplied.
易燃性(固体、气体) <i>Flammability (solid, gas)</i>	不适用。 Not applicable as supplied.

第十部分 稳定性和反应性

Section 10 - Stability and Reactivity

化学稳定性 <i>Chemical Stability</i>	稳定的。 Stable.
危险反应的可能性 <i>Possibility of Hazardous Reactions</i>	不适用。 Not Available.
应避免的条件 <i>Conditions to Avoid</i>	火焰、火花和其他火源，不相容的材料。 Flames, sparks, and other sources of ignition, incompatible materials.
不相容材料 <i>Incompatible materials</i>	氧化剂、酸、碱。 Oxidizing agents, acid, base.
有危害分解物 <i>Hazardous Decomposition Products</i>	一氧化碳、二氧化碳、氧化锂烟雾。 Carbon monoxide, carbon dioxide, lithium oxide fumes.

第十一部分 毒理学信息

Section 11 - Toxicological Information

刺激 <i>Irritation</i>	内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。 In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
致敏 <i>Sensitization</i>	不适用。 Not Available.
再生毒性 <i>Reproductive Toxicity</i>	不适用。 Not Available.

协同材料毒理学 <i>Toxicologically Synergistic Materials</i>	不适用。 Not Available.
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第十二部分 生态学信息

Section 12 - Ecological Information

通用信息: <i>General note:</i>	不允许未稀释或大量的产品接触地下水、水道或污水处理系统。 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
化学产品在环境/可能的环境预期的行为的一种生态毒性 <i>Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity</i>	不适用。 Not Available.

第十三部分 废弃处置

Section 13 - Disposal Considerations

废弃处置方法 <i>Waste Treatment</i>	建议遵照国家和地方法规处置或再利用。 Recycle or dispose of in accordance with government, state & local regulations.
废弃注意事项 <i>Attention for Waste Treatment</i>	废电池不能被当作普通垃圾。不能扔进火中或置于高温下。不能解体，刺穿，破碎或类似的处理。最好的处理办法是回收利用。 Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

第十四部分 运输信息

Section 14 - Transport Information

UN 编号 <i>UN number</i>	UN3090 or UN3091
运输专用名称 <i>Proper shipping name</i>	锂金属电池（包括锂合金电池）或 Lithium metal batteries (including lithium alloy batteries) or 与设备包装在一起的锂金属电池（包括锂合金电池）或 Lithium metal batteries packed with equipment (including lithium alloy batteries) or 内置在设备中的锂金属电池（包括锂合金电池） Lithium metal batteries contained in equipment (including lithium alloy batteries)
危险货物类别 <i>Class or division</i>	9
海洋污染物（是/否） <i>Marine pollutant (Yes/No)</i>	否 No

包装等级 Packing group	不适用 N/A
无论是对内还是对外的运输或运输方式，用户都需要注意或遵守的特殊预防措施。 <i>Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises</i>	
国际民间航空组织/国际航空运输协会： ICAO / IATA:	货物可根据民用航空组织(ICAO)，TI 或国际航空运输协会(IATA)，DGR 66 th (2025版)包装说明(PI)968 Section IB或PI 969 Section II 或PI 970 Section II 相关规定进行空运。 Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 968 Section IB, or (PI) 969 Section II, or (PI) 970 Section II appropriate of IATA DGR 66 th (2025 Edition) for transportation.
国际海运危险货物规则： IMDG CODE:	根据特殊规定188，该电池不受IMDG Code 2024 版(Amdt 42-24)限制。 The batteries are not restricted to IMDG Code 2024 Edition (Amdt 42-24) according to special provision 188.
此外，每个锂电池和电池组类型都必须通过联合国《关于危险货物运输的建议书 试验和标准手册》第 38.3 节规定的适用测试 In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

第十五部分 法规信息

Section 15 - Regulatory Information

- a) 《危险物品规则》
Dangerous Goods Regulations
- b) 联合国《关于危险货物运输的建议书 规章范本》
Recommendations on the Transport of Dangerous Goods-Model Regulations
- c) 联合国《关于危险货物运输的建议书 试验和标准手册》
Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
- d) 《国际航空运输协会》(IATA)
International Air Transport Association (IATA)
- e) 《国际海运危险货物规则》(IMDG)
International Maritime Dangerous Goods (IMDG)
- f) 《危险货物安全运输技术指南》
Technical Instructions for the Safe Transport of Dangerous Goods
- g) 《危险货物分类和品名编号》- GB 6944-2012
Classification and code of dangerous goods (GB 6944-2012)
- h) 2012《职业安全与健康标准》危险通信标准 (29 CFR 1910.1200)
2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
- i) 《有毒物质控制法》(TSCA)
Toxic Substance Control Act (TSCA)
- j) 《联邦条例》
Code of Federal Regulations
- k) 符合所有联邦、州和地方法律
In accordance with all Federal, State and local laws

第十六部分 其他信息

Section 16 - Other Information

本份 MSDS 中的信息只是基于我们当前所拥有的相关材料的信息而编制的，只是为了描述本品的健康、安全与环境需求，以使各有关方面能更好地了解和信任本产品。这些信息只是提供给您，以供考虑、研究和确认。其中的一些危害预防措施描述并非唯一的。所以本份 MSDS 不能作为使用本品实现任何特定目的的保证。各有关使用者有责任预先完成本品的安全性及其他方面的测试，以评判其是否满足您的使用目的。

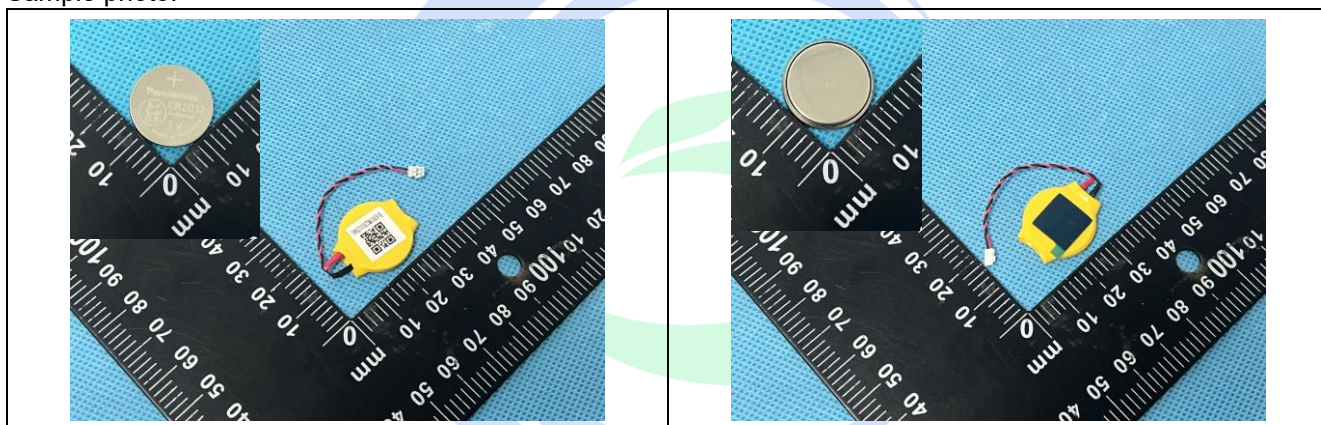
To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

样品图片：

Sample photo:



--报告结束--
--End of report--



堆码测试报告

Stacking Test Report

报告编号
Report No.

CCJC2512701R04

样品名称
Sample name

不可充电锂电池
Non Rechargeable Lithium-ion Battery

型号
Model

CR2032

申请商
Applicant

苏州新亚电通股份有限公司
Suzhou Xinya Electric Communication Co.,
Ltd

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

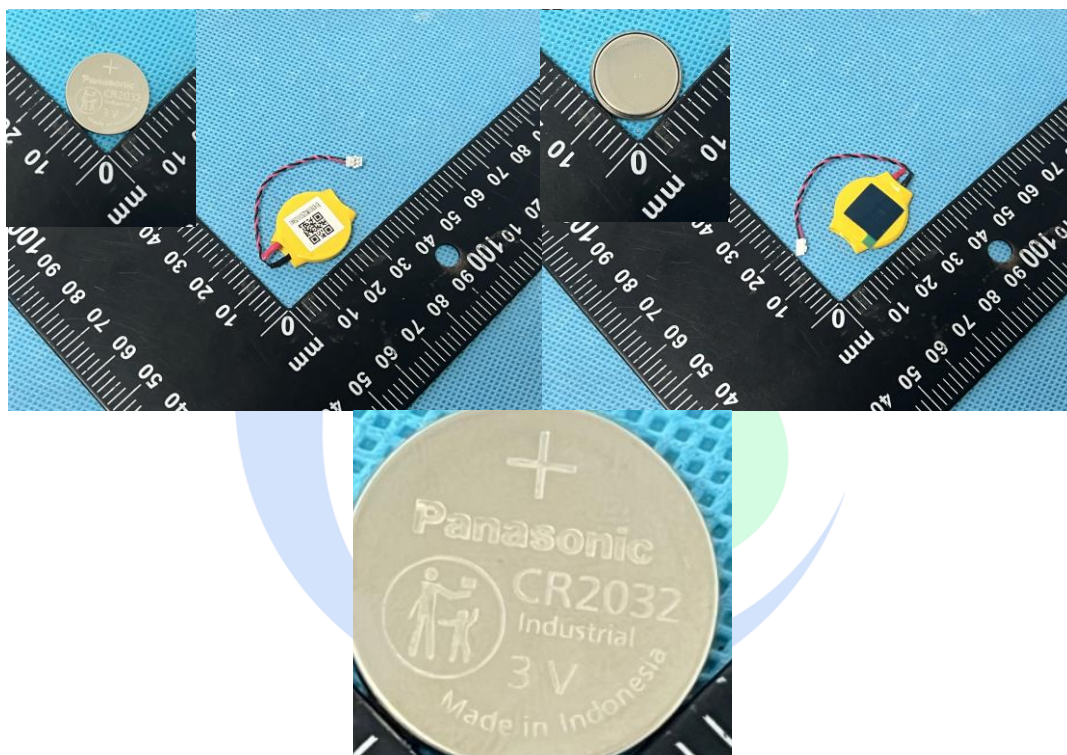
样品名称 Sample name	不可充电锂电池 Non Rechargeable Lithium-ion Battery	样品型号&规格 Sample Model Specification	CR2032 3.0V 225mAh
申请商 Applicant	苏州新亚电通股份有限公司 Suzhou Xinya Electric Communication Co., Ltd		
包装件生产单位 Manufacturer of Package	PT.Panasonic Gobel Energy Indonesia		
包装生产单位 Manufacturer of Packaging	苏州豪格威包装有限公司 Suzhou Haogewei Packaging Co., Ltd		
包装件描述 Description of Package	包装名称:五层瓦楞纸箱 尺寸: 430mm*330mm*280mm (L*W*H) 内装锂电池数量: 720 个 衬垫及其他部件: 托盘 包装件电池净重: 2.49kg 包装件毛重: 6.2kg		
测试方法和判定标准 Test method and criterion	联合国《关于危险货物运输的建议书 规章范本》(23 修订版)条款 6.1.5.6 UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Model Regulations(23 rd Rev. edition) Clause 6.1.5.6		
测试项目 Test items	堆码试验 Stacking test		
样品数量 Quantity of samples	3 个包装件	样品预处理环境 Ambient of Sample Preparation	环境温度: 23°C±2°C 相对湿度: 50%±2%
样品接收日期 Accepted date	2025-03-31	检测日期 Test date	2025-04-21~2025-04-24
测试结论 Conclusion	被测试包装件能够承受 3 米堆码试验, 试验样品未泄漏, 未显出可能对运输安全有不利影响的损坏, 或者可能降低其强度或造成包装件堆码不稳定的变形。 The tested package is capable of withstanding the 3m stacking test, No test sample may show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages.		
主检人: 陈天文 Tested by: 测试工程师 Test Engineer 批准人: 程宇 Approved by: 技术负责人 Technical Manager 审核人: 陈东 Inspected by: 项目工程师 Project Engineer 签发日期: 2025-04-30 Date of Issue:			

Clause	Requirement + Test	Result - Remark	Verdict
6.1.5.6	堆码试验/ Stacking test		P
	在试验样品的顶部表面施加一力量，此力相当于运输时可能堆叠在它上面的同样数量包装件的总重量；包括试验样品在内的最小堆码高度应是 3 米。试验时间为 24 小时。 The test sample shall be subjected to a force applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during transport; The minimum height of the stack including the test sample shall be 3 meters. The duration of the test shall be 24 hours.		P
	$P = K \times \left(\frac{H-h}{h} \right) \times m$ P-加载的负荷 (kg) P-Load loaded(kg) ; K-劣变系数,K 值为 1 K-deterioration coefficient, K value is 1; H-堆码高度(m),(不少于 3m) H-stacking height (m), (not less than 3m) ; h-单个包装件高度 (m) h-Height of single package(m); m-单个包装件毛质量(毛重) (kg) m-Gross mass (gross weight) of a single package(kg)	加载的负荷 P=60.23kg	P
	试验后试验样品不得泄漏。对复合或组合包装而言，不得有所装的物质从内贮器和内包装中漏出。试验样品不得显出可能对运输安全有不利影响的损坏，或者可能降低其强度或造成包装件堆码不稳定的变形。 No test sample may leak. In composite packagings or combination packagings, there shall be no leakage of the filling substance from the inner receptacle or inner packaging. No test sample may show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages.	P1~P3: 包装件未泄漏、未损坏、未降低强度、未造成包装件堆码不稳定的变形 No leak, No deterioration, No reduce its strength, No cause instability in stacks of packages.	P

包装 Package:



电池 Battery:



声 明

Statement

1. 本报告无本单位报告专用章和批准人签章无效。

This report is invalid without the special seal for report of CCJC and the signatures of approver.

2. 本报告涂改和删除无效。

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3. 委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to CCJC within 15 days.

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The client should provide samples and relevant data, otherwise we will not bear any relevant responsibilities.

测试实验室.....:	深圳诚测检测技术有限公司
Testing Laboratory.....:	Shenzhen CCJC Technology Co., Ltd
地址.....:	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101（1-3 层）
Address.....:	1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
电话 Tel.....:	0086-755-23707853
邮箱 Mail.....:	lab@ccjctek.com
网址 Website.....:	www.ccjctek.com