Product Specification

产品规格承认书

Customer Code 客户代码:

Customer Part Number.客户产品料号:

Coincell Battery Cell Model. 电芯型号: **M11390L1**

Coincell Battery Part Number. 产品料号:

Prepared by 制作人	Checked by 审核人	Approved by 批准人
Ruixian.ou	YanT	Rody

Customer Approval 客户承认	Customer Signature/Date 客户签名/日期	Customer Company Stamp 客户公司盖章

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Revision History

版本履历表

Revision 版本	Description 内容描述	Issued by 发行人	Approved by 审批人	Date 日期
V1	首次发行 First Release	Ruixian.ou	YanT	2021-04-06

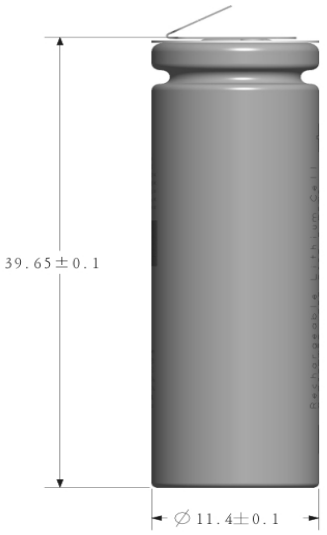
Contents 目录

1. Scope 概述

This document describes the specification of rechargeable Li-ion battery cell which is designed and manufactured by **Shenzhen CoinCell Battery Co., Ltd.**

这文件描述由 **潜坰布算战瑠尖眼洛构颁六叹** 设计制造的可充电锂离子电芯的规格。

2.Battery cell specification 电芯规格:

No.	Item 项目		Parameters 参数	
1	Battery cell model 电芯型号		M11390L1	
2	Minimum capacity （First 3 cycles average），T=25/40℃，0.2C/0.2C Rate 最小容量（全放三次平均值） 25/40 ℃，0.2C 充放条件下		250mAh	
3	Typical capacity典型容量 （0.2C 充/放电）		270mAh	
4	Nominal voltage标称电压		3.2V	
5	Charge ending voltage充电限制电压		3.65±0.03V	
6	Discharge ending voltage 放电终止电压		2.55V	
7	Maximum cell dimension 电芯最大尺寸		D:11.50mm H: 39.75mm	
8	Cell weight 电芯重量		＜14g	
9	Cell Impedance内阻		≤70mΩ（Impedance test accordingly to IEC61960，100%SOC) ≤70mΩ（内阻按 IEC61960 方法测量，电池为满电状态）	
10	Standard charge current 标准充电电流		1600mA	At 23℃±2℃ 在 23℃±2℃的环境温度条件下
11	Charge cut off current 充电截止电流		125mA	CV Mode 恒压充电模式下
12	Standard discharge current 标准放电电流		635mA	
13	Peak discharge current 峰值放电电流		3400mA	Max 1S 最大放电时间：1 秒
14	Operation windows 工作环境	Operating temperature Charging 充电温度	1℃≤T<15℃	1000mA
			15℃≤T＜45℃	1600mA
			45≤T＜60℃	1600mA，reduced cycle life and no safety impact 充电使用1.6A电流，循环寿命减少，但无安全影响
			60≤T＜65℃	1000mA，reduced cycle life and no safety impact 充电使用1A电流，循环寿命减少，但无安全影响
			T≥65℃	禁止充电
		Operating temperature Discharging	1℃≤T＜45℃	Pulse discharge current：3.4A 脉冲放电电流：3.4A
			45℃≤T＜65℃	With 3.4A pulse discharge, the cycle life is reduced,

		放电温度		but there is no safety impact 用 3.4 A 脉冲放电，循环寿命减少，但无安全影响
			T≥65℃	禁止放电
		Humidity 湿度	5%～95%	
		Ambient pressure 环境压力	35kPa～110kPa	
15	Cycle life 循环寿命 （6C charge充电 6C discharge放电）		5000次充放电后，电池恢复80%的初始容量 After 5000cycles charge/discharge, battery can recover 80% of its initial capacity	
16	Storage environment 存储环境	Storage temperature 存储温度	-20～50℃	1. Recommended SOC 20-60%. 推荐带电量为 20-60% 2. Storage time: 1 month. 可存储时间：一个月
			-20～40℃	1. Recommended SOC 20-60%. 推荐带电量为 20-60% 2. Storage time: 3 month. 可存储时间：三个月
			-20～30℃	1. Recommended SOC 20-60%. 推荐带电量为 20-60% 2. Storage time: 6 month. 可存储时间：六个月
			-20～20℃	1. Recommended SOC 20-60%. 推荐带电量为 20-60% 2. Storage time: 12 month. 可存储时间：12个月
		Humidity 湿度	5%～70%	Non condensing（非冷凝）
		Ambient pressure 环境压力	35kPa～110kPa	
17	Self-discharge 自放电	Storage temperature 30°C 30℃条件下存储	1 month storage at SOC both 30% and 100% 30%和100% SOC下存储1个月	Remaining capacity ≥ 80% Recoverable capacity ≥ 90% 容量保持率≥80% 容量恢复率≥90%
18	Venting pressure 防爆阀压力		8-10MPa	
19	Shipment SOC 出货带电量		Air transport 空运 20%～30%SOC （3.20±0.10V）	
			Land transport/sea transport 陆运/海运 40%～60%SOC （3.25±0.10V）	
20	Certification requirement 认证要求		UN38.3, IEC62133, UL1642, RoHS, REACH	

2.1 Cell drawing 电芯示意图

Content of the code 打码内容:

Cell type电芯类别: Rechargeable Lithium Cell 可充性锂离子电芯

Manufacturer制造商：Shenzhen CoinCell Battery

Product Certification Mode产品认证型号：IFpR12/40

Product Mode in CoinCell Battery 产品型号: M11390L1 (M=CoinCell Battery, 11 = cell diameter, 390 = cell height， L1 = Capacity identification)

Nominal voltage标称电压：3.2V； capacity容量：250mAh；Energy能量：0.8Wh

电芯底部打二维码。

3．Performance and Test Criteria 电池性能和测试标准

3.1 Standard Test Criteria标准测试标准

If test criteria is not defined, test should be done under the below standard test criteria.

如果测试标准没有定义，测试标准会按以下测试完成。

Test Criteria测试标准	**Parameters 参数**
Ambient Temperature 环境温度	23±2°C
Relative Humidity 相对湿度	65±20%
Atmospheric pressure 大气压力	86～106 kPa
Charge 充电	Standard charge process 标准充电流程
Discharge 放电	Standard discharge process 标准放电流程
Delivery Time from CoinCell Battery从科恩瑟尔电池发出时间	Within 1month 一个月内

3.2 Visual Inspection 外观检查

No crack，no leakage, no rust

没有破裂，没有漏液，没有生锈

3.3 Measuring Instrument Standard 测量仪器标准

Instrument 仪器	**Standard 标准**
Instrument to measure dimension 测试尺寸仪器	Precision scale : 0.01mm 精度：0.01mm
Voltmeter伏特计	Internal impedance ＜ 10kΩ/V 内阻 ＜ 10kΩ/V
Ammeter 安培计	Impedance of ammeter and wires ＜ 0.01Ω 安培计和电线内阻＜ 0.01Ω
Impedance meter 阻抗计	Impedance is measured by sinusoidal 1kHz AC current 内阻测试用1kHz正弦交流电流

3.4 Standard charge process 标准充电流程

At 23±2°C charge as follows. 在 23℃±2℃环境下，按以下工步充电：

ID	Step Name	Voltage（V）	Current（mA）	End Current（mA）
1	CC-CV-charge	3.65	1600	125

3.5 Standard discharge process 标准放电流程

At 23±2°C charge as follows. 在 23℃±2℃环境下，按以下工步放电：

ID	Step Name	Time Limit (H:M:S.ms)	Voltage（V）	Current（mA）
1	rest	0:00:30		
2	CC-discharge		2.55	635

3.6 Initial impedance 初始内阻值

At 23±2°C，Impedance measured accordingly to IEC61960 ； Battery is fully charged by standard charge process. AC impedance tester at 1kHz. The initial impedance should be≤70mΩ.

在23±2℃环境下，内阻按 IEC61960 测试方法测量，电池用标准充电流程充满电。再使用交流阻抗测试仪（at 1KHz）测量初始内阻。电芯初始内阻应≤70mΩ.

3.7 Initial capacity 初始容量值

At 23±2°C，Capacity checking steps as follows. Initial capacity≥250mA.在 23℃±2℃环境下，按以下工步测试容量，电芯初始容量≥250mAh。

ID	Step Name	Time Limit (H:M:S.ms)	Voltage（V）	Current（mA）	End Current（mA）
1	rest	0:00:10			
2	CC-CV-charge		3.65	1600	125
3	rest	0:00:30			
4	CC-discharge		2.55	635	

3.8 Cycle life 循环寿命

Test procedure 测试步骤:

Step 1: Battery pack is charged by 6C constant current at 25±2°C until 3.65V. Then, battery cell is charged by constant voltage at 3.65V until current drop to 0.02C.

Step 2: Wait for 10mins

Step 3: Battery pack is discharged by 6Ccontinuous current at 25±2°C until the voltage drop to 2.55V.

Step 4: Wait for 10mins

Step 5: Repeat step1 to step 4 until 5000 cycles，the capacity of Battery pack should be more than or equal to 80% initial capacity.

1）电池成品在 25±2°C 按 6C 恒流充电直到 3.65V，再用 3.65V 恒压充电直到充电电流小于 0.02C。

2）等待 10 分钟

3）电池成品在 25±2°C 按 6C 恒流放电直到 2.55V

4）等待 10 分钟

5）重复 1）到 4），直到 5000 周，电池容量≥80%初始容量值。

4.Environmental characteristics 环境特性

No.	Test item 测试项目	Test Method 测试方法	Pass Criteria 合格标准
1	Charged Storage Characteristics 荷电保持能力	At 25℃±3℃，charge the cell at 1.6A to 3.65V (cut-off current125mA), then discharge at 0.635A to 2.55V, and record the discharge capacity as the initial capacity C1. And then, charge the cell to 30% SOC and 100% SOC at 1.6A current (30% SOC: the upper limit of voltage is set to 3.65V, the cut-off capacity is 75mah; 100% SOC: the upper limit of voltage is set to 3.65V, the cut-off current is 125mA), store it for 30 days at 30℃, and then discharge at 0.635A to 2.55V, and record the discharge capacity as the remaining capacity C2. Finally, charge the cell at 1.6A to 3.65V (cut-off current 125mA) , then discharge at 0.635A to 2.55V, record the discharge capacity as recoverable capacity C3. 电芯在 25℃±3℃下以 1.6A 电流充电至 3.65V（截止电流 125mA），然后以 0.635A 放电至 2.55V，记录该放电容量为初始容量 C1。再将电芯以 1.6A 电流分别充至 30%SOC 和 100%SOC（30%SOC：电压上限设置为 3.65V，截止容量 75mAh；100%SOC：电压上限设置为 3.65V，截止电流 125mA；），然后将不同带电量电芯在 30℃的环境温度下存储 30 天，之后以 0.635A 放电至 2.55V，记该放电容量为电芯剩余容量 C2。最后，再以 1.6A 电流充电至 3.65V（截止电流 125mA），然后以 0.635 A 放电至 2.55V，记录该放电容量为可恢复容量 C3。	Capacity reserve rate C2/C1≥ 80%, Capacity Recover rate C3/C1≥ 90% 剩余容量保持率 C2/C1≥80%; 容量可恢复率 C3/C1≥90%

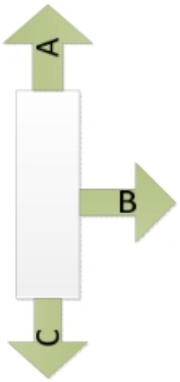
5．Safety Test安全测试

CoinCell battery can meet several international safety standards. Below is part of safety tests which are referred to international standard.

深圳市科恩瑟尔电池有限公司的电池能达到多个国际电池安全标准。以下是部分安全测试项目。

No.	Test item 测试项目	Test Method 测试方法	Criteria 标准
1	Constant Humidity and Temperature test 恒定湿热测试	Battery cell is fully charged by standard charge process. Then，battery cell is put into chamber with constant humidity(90~95%) and temperature (40±2°C) for 48hrs. After test, battery idle for 2hrs at 23±2°C and discharge by 0.2C to 2.55V. 电芯按标准充电流程满充电。之后电芯放在恒温箱 48 小时，湿度为 90~95%和温度为 40±2°C。测试后电芯在 23±2°C 环境下静置 2h，再已 0.2C 放电至 2.55V。	After test, battery cell can discharge ≥3hrs No fire, No leakage, No explosion 无起火，无漏液，无爆炸
2	Overcharge Test 过充电测试	After discharge at 0.2C to 2.55V, charge at constant current 1.7A and constant voltage 5V, when the test meets any one of the following two status, then stop. The continuous charging time reach 7h，or the temperature of the cell drop to 20% lower than the peak. 电芯以 0.2C 电流放电至 2.55V 后，采用 1.7A 电流 5V 电压恒流恒压充电，当实验满足以下两种情况中任意一种时即可停止： a)电芯持续充电时间达到 7h； b)电芯温度下降到比峰值低 20%。	No fire, No explosion 无起火， 无爆炸

3	Short test 短路测试 (IEC62133)	Battery cell is fully charged by standard charge process, place the cell with thermocouple into the fume hood, use copper wires to short circuit the positive and the negative (The total resistance of the line is 50±20mΩ). Watch the cell temperature changes during test , when the cell temperature drop to 20% lower than the peak or the time of short circuit reach 24 hours, end the test. 电芯按标准充电方式充电后，将其接好热电偶并置于通风橱中，然后用铜线短路其正负极(线路总电阻为 50±20mΩ)，实验过程中监视电芯温度变化，当电芯温度下降到比峰值低20%或短接时间达到 24 小时时，结束实验。	No smoke, no fire, no explosion , no rupture and leakage less than 1% of mass loss 电芯应不冒烟、不起火、不爆炸、不破裂且漏液质量损失≤1%
4	Over discharge Test 过放电测试 (IEC62133)	At 23±2°C, battery cell is discharged by 0.2C until 2.55V. And then battery cell is connected the load with 30Ω to discharge for 7hours. 电芯在 23±2°C 用 0.2C 放电到 2.55V。 之后电芯连接 30Ω负载放电 7 小时。	No fire, No explosion 无起火，无爆炸
5	Projectile Test 焚烧测试	Battery cell is fully charged by standard charge process. Battery cell is placed on the screen which is to be constructed by steel wire mesh. The screen is mounted above the burner. And eight-sided covered wire cage is to be placed over the battery cell. Battery cell is to be heated and remain on the screen until it explodes or has been ignited or burned out. 电芯按标准充电流程满充电。将电芯放在钢丝网上，钢丝网下有燃烧器和钢丝网被八面铝网盖住。电芯在钢丝网上被加热直到电芯爆炸或被点燃或完全烧毁。	Any part of an exploding cell shall not penetrate the wire screen. 电芯的任何部分不得穿出此八面铝网。
6	Drop Test 掉落测试 (IEC62133)	Battery cell is fully charged by standard charge process, the cell drop freely to the cement floor from a height of 1m in three directions as shown in the figure below, once in each direction. Then rest for 1	No smoke, no fire, no explosion, no rupture 电芯应不冒烟、不起火、不爆

		hour to visually inspect the appearance of the cell. 电芯按标准充电方式充电后，按下图所示 3 个方向，由高度为 1m 的位置自由跌落到水泥地面上，每个方向跌落 1 次。然后搁置 1 小时，目测电芯外观。 	炸、不破裂
7	Crush test 挤压测试 （IEC62133）	Battery cell is fully charged by standard charge process, place the cell between two flat surfaces to crush. The pressure vessel is forced vertically to the cylindrical cell and presses the cell. Use hydraulic piston of diameter 32mm, pressure 13±0.78KN, once get max pressure value or the voltage suddenly drop 1/3 of initial voltage or the cell surface makes 10% deformation(whichever occurs first) , you release pressure. 电芯按标准充电方式充电后，放在两个平整的表面进行挤压测试，压力器必须施加一个与圆柱电芯轴向垂直的力，平压于电芯。采用 32 mm 直径的液压活塞，所用压力为 13 ± 0.78KN，一旦达到最大压力值或者电压骤然降低了初始电压的 1/3，或电池表面发生了 10%的形变时应释放压力（以先发生者为准）。	No fire, No explosion 无起火，无爆炸
8	Acceleration shock 加速度冲击	Battery cell is fully charged by standard charge process. Battery cell is secured to the testing machine by means of a rigid mount which will support all mounting surfaces of the battery cell. The battery cell is subjected to a total of two shocks of equal	No fire, No explosion， 不起火，不爆炸

		magnitude. The shocks are to be applied in each of two mutually perpendicular directions. For each shock the battery cell is accelerated in such a manner that during the initial 3ms the minimum average acceleration is 75g. The peak acceleration shall be between 125 g and 175 g. Battery cell is tested at 20± 5℃ 电芯按标准充电流程满充电。在环境温度下，将电芯分别按二个轴向固定在测试台面上，前 3ms 内平均加速度最少达到 75g（g 为重力加速度），峰值加速度达 125g 至 175g。电芯测试温度为 20±5℃	
9	Low Pressure test 低气压 测试 (UN38.3)	Battery cell is fully charged by standard charge process, then put it in to the vacuum chamber. After the vacuum chamber is closed, gradually reduce the internal pressure to less than 11.6kPa and keep 6h. 电芯按标准充电方式充电后，将其搁置在真空箱中。真空箱密闭后，逐步减少其内部压力至不高于 11.6kPa 并保持 6h。	No leakage (△W≤0.2%), no gas release, no cracking, no fire, no explosion. voltage is not less than initial value 90%. 不漏液(△W≤0.2%)、不泄气、不爆炸、不破裂、不 起 火 ，电 池 电 压≥90%初始电压

6．Usage of battery 使用电池

Shenzhen CoinCell Battery Co., Ltd **DO NOT** take responsibility if customer **DO NOT** follow the specification and below instruction using the battery.

如果客户**没有**按规格书和以下说明使用电池，深圳市科恩瑟尔电池有限公司将**不负**任何责任。

To have good performance of battery, battery should follow this battery specification to use and storage.

Recommend to charge battery every 6 months using standard charge process.

To use the battery safe, battery is prohibited to disassemble, drop, heat, burn, soak, crush, shock, short circuit.

Enough insulation inside the customer's end product is required to avoid the short circuit of the battery.

Battery should have enough space to install inside the customer's end product. Please use the maximum dimension of battery pack after cycle life to reserve the space.

To protect the battery, battery should be installed in the customer's end product with strong mechanical strength.

Any movement of the battery in the end product should be avoided.

If battery has any abnormal feature such as battery cannot be charged and discharged, abnormal heat generate, deformation, smelling of electrolyte or leakage, battery should be stopped to use immediately.

Battery with smelling of electrolyte or leakage should be placed away from fire. Electrolyte is harmful. If electrolyte is contacted the skin or eyes, please flush electrolyte by purified water and consult doctor.

为了电池保持良好的性能，电池需要按本规格书使用和储存。

建议电池每6个月按标准充电流程充电一次。

为了安全使用电池，电池禁止拆解，掉落，加热，焚烧，浸泡，挤压，撞击，短路。

客户终端产品需要有足够的绝缘，避免电池被短路。

客户终端产品需要有足够的空间组装电池。空间需求请按规格书中循环后的电池成品最大尺寸进行设计。

客户终端产品需要有强力的结构保护电池。

请避免电池在客户终端产品中能移动。

如果电池有异常特征，比方说电池不能充放电，发热异常，变形，有电解液气味或漏夜，电池应马上停止使用。

电池有电解液气味或漏夜须要远离火种。电解液是有害的。如果电解液接触到皮肤或眼睛，请马上用纯净水冲洗和就医。

7．Warranty 保证期

Shenzhen CoinCell Battery Co., Ltd guarantees the battery at good condition within **12 months** when battery is delivered from CoinCell Battery factory.

科恩瑟尔电池保证电池从出厂日起**12月内**功能良好

8．Others 其他

8.1 Prohibition disassemble 禁止拆卸

1) Never disassemble the cells. The disassembling may generate internal short circuit in the cell, which may cause gassing, firing, explosion, or other problems.

2) Electrolyte is harmful. If electrolyte is contacted the skin or eyes, please flush electrolyte by purified water and consult doctor.

1) 不要拆卸电池。 拆卸电池会发生电池内部短路，会引起起火、爆炸、有害气体或者其它问题。

2) 电解液是有害的。如果电解液沾到皮肤、进入眼睛，应立即用清水冲洗以及求助医生。

8.2 Prohibition of dumping of battery into fire 不要把电池倾倒于火中

Never incinerate nor dispose the cells in fire. These may cause explosion of the cells, which is very Dangerous and is prohibited.

不要焚烧电池，否则会致电池爆炸，这很危险，必须禁止。

8.3 Prohibition of use of damaged battery 禁止使用损坏的电池

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in a plastic envelop of the cell, deformation of the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

电池可能在出货途中碰撞而受损。如果发现电池有异常，例如包装损坏、电池包裹变形，有电解液的味道、发现漏液等等，不要再使用这些电池。电池如果有电解液的味道或者出现漏液，电池放置应该远离火源避免起火及爆炸。

8.4 The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them

以下警告语言将提供与小型电池、电池或设备一起使用的信息:

- Keep batteries out of reach of children to avoid being swallowed, Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion. In case of ingestion of a cell or battery, seek medical assistance promptly.
  把电池放到小孩够不到的地方以免吞服 ,吞下可能导致烧伤,软组织穿孔和死亡。如摄入电池，应立即寻求医疗救助，2小时内未进行处理可能会导致严重灼伤。
- If children use the battery, their guardians should explain the proper handling.
  小孩使用电池时，监护人应详细解释操作方法。

8.5 Any other items are not covered in the specification shall be agreed by both parties.

任何本规格书没有包括的事项，需要双方协议确定。