产品规格书 PRODUCT SPECIFICATION

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2025-07-16
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可充电锂离子电池 Rechargeable Lithium Ion Battery

型号 Type：7VH4L4-314Ah

产品设计准备 Prepared by RD	产品设计审批 Approved by RD	销售审批 Approved by MS	项目工程审批 Approved by PE	品质保证审批 Approved by QA
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客户确认 Client Approval	签名 Signature：	公司印章 Company Stamp：
	日期 Date：	
	客户代码 Company Code：	

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更新记录

版本 Revision	描述 Description	日期 Date	承认 Approval
A0	新版本 Original Release	2023.8.1	高润
A1	转量产修改文件编号 Change the file number to mass production	2023.11.29	高润
A2	修改电池厚度尺寸 Change the battery thickness	2023.12.26	高润
A3	根据新国标升级参数和增加环保措施 Upgrade parameters and add e nvironmental protection measures in accordance with the new national standards	2025.6.13	高润

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客户要求 Customer Inquiry

型号 Model: 7VH4L4-314Ah

版本 Version: A3

客户根据终端产品使用需求提出对电芯的需求并与赣锋锂电沟通，如客户有一些特别的应用或者操作条件不同于此文件中所描述的，赣锋锂电可以根据客户的特别要求进行产品的设计和生产。

The Customer is requested to write down your information and contact GFL in advance, if and when the Customer needs applications or operating conditions other than those described in this document. GFL could design and build such products according to your special request.

编号 No.	特殊要求 Special Request	标准 Criteria
1		
2		
3		
4		
5		

客户代码 Company code： _____ **签字 Signature：** _____ **日期 Date：** _____

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1. 适用范围 Scope

本规格书详细描述了赣锋锂电生产的 3.2V 314Ah 可充电磷酸铁锂体系电池的产品性能指标以及产品使用条件及风险警示。

The purpose of this document is to specify the specifications of 314Ah 3.2V rechargeable lithium ion LFP cells with GFL to be supplied by GFL

2. 产品性能指标 Electrical specification

除另有规定外，本产品规格书中所有带“*”的参数是针对新电芯，即客户到货 7 天内的且未使用的产品，如被客户使用过或者在客户存储超过 7 天的产品，可能会偏移规格书中规定的标准数值，客户同意此类情况发生，不视为产品不合格的表现；

Unless otherwise specified, all parameters marked with "*" in this product specification sheet are for new battery cells, that is, products that have been delivered to the customer within 7 days and have not been used. If the product has been used by the customer or stored by the customer for more than 7 days, it may deviate from the standard values specified in the specification sheet. The customer agrees that such situations shall not be regarded as a sign of product non-conformity.

2.1 概要 General

编号 No.	参数 Parameter		产品规格 Specification	条件 Condition / Note
2.1.1	*标称容量 Nominal Capacity		314.0Ah	25±2℃环境温度，参考 2.2 与 2.3 标准充放电模式测试 25 ± 2℃ ambient temperature, refer to 2.2 and 2.3 standard charging and discharging mode testing
2.1.2	*电池内阻 Impedance (1KHz)		0.195±0.05mΩ	新电池状态 At a fresh state
2.1.3	*出货 SOC Shipment SOC		5%~40%的充电状态 5%~40% SOC	
2.1.4	工作温度(充电) Operating temperature (charging)		0~60℃	参考第 2.2 节 See paragraph 2.2
2.1.5	工作温度(放电) Operating temperature (discharge)		-30~60℃	参考第 2.3 节 See paragraph 2.3
2.1.6	最佳充放电温度范围 Optimum charging and discharge temperature		20~30℃	电芯表面温度温度 Cell surface temperature
2.1.7	存储温度 Storage	1 个月 One month	-30℃-45℃	SOC:25%~40%SOC 存储环境湿度≤85%RH，无凝露

	temperature	6 个月 Six months	-20℃~35℃	SOC:25%~40%SOC;Storage ambient humidity≤85% RH, no condensation
2.1.8	电池重量 Weight		5.55±0.15Kg	N.A.
2.1.9	自放电 Self-discharge		首月≤3.5%; The first month≤3.5%; 次月≤3.0% The next month≤3.0%.	出货三个月以后的电芯，标准充电到40%SOC，25±2℃储存 Fresh cell after 3 months, 40%SOC, 25±2°C Storage
2.1.10	*电池尺寸 Cell dimension		请参考本规格书第 9 条 Reference specification 9	厚度:71.8±0.5mm（5%-40%SOC 300±50Kgf 压力下） Thickness: 71.8±0.5mm（5%-40%SOC 300±50Kgf pressure） 宽度:174.2±0.8mm Width:174.2±0.8mm 高度:207.1±0.8mm Height: 207.1±0.8mm
2.1.11	电芯耐压绝缘 Cell voltage withstand insulation		绝缘电阻≥1GΩ或绝缘电流≤20mA Insulation resistance ≥ 1GΩ or insulation current ≤ 20mA	绝缘电阻测试条件：300±50Kgf 压力下，500±10V 电压 Insulation resistance test conditions: 500±10V voltage at a pressure of 300±50Kgf 绝缘电流测试条件：300±50Kgf 压力下，1500±50V 电压 Insulation current test conditions: 1500±50V voltage at a pressure of 300±50Kgf
2.1.12	应用海拔 Altitude		≤5000m	N.A.

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2.2 充电模式/参数 Charging mode/Parameters

编号 No.	参数 Parameter	产品规格 Specification	条件 Condition /Note
2.2.1	标准充电电流 Standard charge current 标准充电功率 Standard charge Power	0.5C=157A 0.5P=502.4W	25±2℃环境温度 25±2℃ ambient temperature
2.2.2	最大充电可持续电流 Maximum charge current (continuous) 最大充电可持续功率 Maximum charge power (continuous)	1.0C=314A 1.0P=1004.8W	25±2℃环境温度，具体参考第 2.2.8 节 25±2℃ ambient temperature, refer to section 2.2.8 for details
2.2.3	标准充电电压 Standard charge voltage	单体电池最大 3.65V Cell max voltage 3.65V	25±2℃环境温度 25 ± 2℃ ambient temperature
2.2.4	标准充电模式 Standard charge method 标准恒功率充电模式 Standard constant power charge method	0.5C 恒流持续充电至单体电池最大 3.65V，然后在恒压 3.65V 下恒压持续充电直至电流下限 0.05C。0.5C constant current charge to 3.65V for cell, then switch to constant voltage charge until charge current declines to 0.05C. 0.5P 恒功率充电至单体电池最大 3.65V 0.5P constant power charge to 3.65V for cell	

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2.2.5	标准充电温度 Standard charge temperature	25±2℃环境温度 25±2 ℃ ambient temperature	
2.2.6	绝对充电温度 Absolute charge temperature （Cell temperature）	0~60℃	无论电芯处在何种充电模式，一旦发现电芯温度超过绝对充电温度范围即停止充电。Stop charging once cell temperature is outside this range regardless of the charging mode adopted.
2.2.7	绝对充电电压 Absolute charge voltage	最大 3.65V 3.65V max.	无论电芯处在何种充电模式包括再生充电状态，一旦发现电芯电压超过绝对充电电压范围即停止充电。Stop charging once voltage exceeds this voltage regardless of the charging mode (including regeneration) adopted.

2.2.8 其他充电条件模式(P) Other Continuous Charge Conditions (P)

Cell Temperature/℃ 电芯温度/℃		0	5	10	15	20	25	45	50	55	60
MAX charge power/P 最大充电功率 P	0-100%SOC	0	0.12	0.25	0.5	1.0	1.0	1.0	0.5	0.5	0

备注：55-60℃温度间充电倍率采用线性关系，其它温度区间参考最小值温度充电倍率。

Note: The charging rate between 55 and 60℃ adopts a linear relationship, and other temperature ranges refer to the minimum temperature charging rate。

2.3 放电模式/参数 Discharging mode/Parameters

编号 No.	参数 Parameter	产品规格 Specification	条件 Condition /Note
2.3.1	标准放电电流 Standard discharge current 标准放电功率 Standard discharge power	0.5C=157A 0.5P=502.4W	25±2℃环境温度 25±2 ℃ ambient temperature
2.3.2	最大持续放电电流 Maximum discharge current (continuous) 最大持续放电功率 Maximum discharge power (continuous)	1.0C=314A 1.0P=1004.8W	25±2℃环境温度，具体参考第 2.3.6 节 25±2℃ ambient temperature, refer to section 2.3.6 for details
2.3.3	放电截止电压 Discharge cut-off voltage	2.50V	0℃＜T≤60℃
		2.00V	-20℃≤T≤0℃
2.3.4	标准放电温度 Standard discharge temperature	25±2℃环境温度 25±2 ℃ ambient temperature	N.A.
2.3.5	绝对放电温度 Absolute discharge temperature （Cell temperature）	-30~60℃	无论电芯处在持续放电模式或脉冲放电模式，若电芯温度超过绝对放电温度，则停止放电。Must stop discharging once cell temperature is outside

			this range regardless of the discharging mode adopted.

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2.3.6 其他放电条件模式(P) Other continuous discharge Conditions (P)

Cell Temperature/℃ 电芯温度/℃		-30	5	10	15	20	25	45	50	55	60
MAX discharge power/P 最大放电功率P	0-100%SOC	0.2	0.3	0.5	0.8	1.0	1.0	1.0	0.5	0.5	0

备注：55-60℃温度间放电倍率采用线性关系，其它温度区间参考最小值温度放电倍率。
Note: The discharge rate between 55 and 60℃ adopts a linear relationship, and other temperature ranges refer to the minimum temperature discharge rate。

2.4 再生脉冲充/放电模式 Regeneration

再生脉冲充/放电是指在产品使用过程中，脉冲电流对电芯的充/放电。再生脉冲充/放电必须严格符合本规格书所述的充/放电状态和电芯温度条件。脉冲电流的大小和持续时间必须严格遵守下表所列的所有充/放电状态以及电芯温度等条件。违反再生脉冲充/放电条件可能会造成电芯永久性的损坏并进而免除赣锋锂电的产品质量责任。

Regeneration means a cell is charged or discharged by pulse current regenerated during application. The regenerated voltage should be strictly regulated at all SOC and Cell Temperature. The magnitude and duration of pulse charging or discharging current should be strictly regulated according to the SOC and Cell Temperature listed on the table below. Regeneration charging or discharging of the cell outside this allowable condition may cause permanent internal damage to the Product and shall render GFL's warranties under the Contract inapplicable, thereby releasing GFL from any liability in connection therewith.

2.4.1 最大再生脉冲充电电压 3.65V，最小再生脉冲放电电压 2.50V

2.4.1 Regeneration voltage 3.65V maximum,2.50V minimum

2.4.2 允许的再生脉冲充电电流和持续时间 Allowable regeneration pulse charging current and duration

10s 再生脉冲充电电流(C) Regeneration pulse charging for 10s (C)

T/SOC	0%	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0℃	0	0	0	0	0	0	0	0	0	0	0	0
5℃	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.30	0
10℃	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.60	0
15℃	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	0.80	0
20℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
25℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
30℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
35℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
40℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
45℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
50℃	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.00	0
55℃	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	0.80	0
60℃	0	0	0	0	0	0	0	0	0	0	0	0

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2.4.3 允许的再生脉冲放电电流和持续时间 Allowable regeneration pulse discharging current and duration

10s 再生脉冲放电电流(C) Regeneration pulse discharging for 10s (C)

T/SOC	0%	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
-30℃	0	0.03	0.06	0.13	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
-25℃	0	0.06	0.13	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
-20℃	0	0.06	0.13	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
-15℃	0	0.06	0.13	0.25	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
-10℃	0	0.10	0.20	0.40	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
-5℃	0	0.15	0.30	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0℃	0	0.25	0.50	1.00	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
5℃	0	0.25	0.50	1.00	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
10℃	0	0.25	0.50	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
15℃	0	0.30	0.60	1.20	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
20℃	0	0.30	0.60	1.20	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
25℃	0	0.38	0.75	1.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
30℃	0	0.38	0.75	1.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
35℃	0	0.38	0.75	1.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
40℃	0	0.38	0.75	1.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
45℃	0	0.38	0.75	1.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
50℃	0	0.25	0.50	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
55℃	0	0.15	0.30	0.60	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
60℃	0	0	0	0	0	0	0	0	0	0	0	0

2.4.4 每次再生脉冲充/放电后，电池需要有段休眠时期，时间应等于或长于再生脉冲持续时间。休眠时期内，电池可以处于放电状态，也可以处于零电流不工作状态，但在休眠时期内，不允许电池再次发生再生脉冲充/放电现象。

2.4.4 After each regeneration pulse, there should be a 'rest period' with duration equal to or long than the relevant regeneration pulse. A 'rest period' can either be discharging or zero current state. No regeneration is allowed within a 'rest period'.

2.5 不同温度放电容量 Discharge Capacity of different temperature

编号 No.	参数 Parameter	产品规格 Specification	条件 Condition / Note
2.5.1	45℃的能量 Energy at 45°C	≥1004.8Wh	新电池状态，45°C±2 环境温度，0.5P，2.5V~3.65V Fresh cell, 45℃±2 ambient temperature, 0.5P, 2.5V~3.65V

2.5.2	5℃的能量 Energy at 5°C	≥804Wh	新电池状态，5°C±2 环境温度，0.5P，2.5V~3.65V Fresh cell，5°C±2 ambient temperature，0.5P，2.5V~3.65V

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2.6 安全与可靠性 Safety and Reliability

2.6.1 使用条件说明：安全测试、寿命测试、系统成组设计需要施加预紧力，新电芯稳定状态的预紧力范围为500N~7000N，建议的预紧力范围 3000±200N；

Instructions for use conditions: Safety testing, life testing, and system group design require the application of preload. The preload range for the new battery cell state is 500N~7000N, and the recommended preload range is 3000± 200N 。

2.6.2 产品在使用过程中会产生膨胀力，电芯在 15mm 钢板测试条件下衰减至 80%时膨胀力约为 40000N，客户在产品设计过程中需要考虑结构强度可靠性，建议电芯成组预留 1.0~2.0mm 的间隙。

The cell will generate swelling force during attenuation. The swelling force of the cell at 80% SOH under the test condition of 15mm steel plate, which is about 40000N. The customer needs to consider the reliability of structural strength in the product design process. It is suggested that 1.0 ~2.0mm Gap be reserved for the cell assembly module.

2.6.3 电芯级安全标准参考 GBT36276-2023，除跌落、挤压以外，过充、过放、短路、过载、热失控、高海拔初始充放电性能试验等安全测试，需要带上夹具测试，夹具预紧力建议 3000±200N；

The safety standard for cells refers to GBT36276-2023. In addition to drop and extrusion tests, safety tests such as over-charge, over-discharge, short circuit, overload, thermal runaway, and initial charge-discharge performance at high altitude require the use of fixtures for testing. The recommended preload force of the fixtures is 3000±200N

3. 电芯寿命 Cycle Performance

编号 No.	参数 Parameter	产品规格 Specification	条件 Condition / Note
3.1	常温存储 3 个月 Store at RT for 3 months	容量恢复率≥98% Capacity recovery rate ≥98%	25±2°C 环境温度，初始夹紧力 300±50Kgf，0.5P 标准充电至 5-40%SOC 存储 90 天 25±2°C, 0.5P standard charging to 5-40% SOC storage under 300±50Kgf preload for 90 days
3.2	循环寿命 Cycled Capacity	8000 次@219.8Ah 8000 Cycles@219.8Ah	25±2℃恒温箱环境温度，0.5C 或 0.5P 充放电，2.5-3.65V，搁置 30min，300±50Kgf 初始压力下 0.5C or 0.5P charge and discharge, 2.5-3.65V, rest 30min, thermotank temp.: 25±2°C, 300±50Kgf preload.

4. 产品寿命终止管理 Product End of Life Management

电池的使用期限是有限的。客户应该建立有效的跟踪系统监测并记录每个使用期限内电池的内阻。内阻的测量方法和计算方法需要客户和赣锋锂电共同讨论和双方同意。当使用中的电池的内阻超过这个电池最初的内阻的 150%（1KHz 下的交流内阻）或容量小于 70%（25℃）时，应停止使用电池。违反该项要求，将免除赣锋锂电依据产品销售协议以及本规格书所应承担的产品质量保证责任。

This cell is designed to service with a finite life time. Client shall develop and implement an active tracking system to monitor and record impedance of each Product in its entire service life. Client and/or its customer shall stop using any of the Products when its impendence exceeds 150% (AC internal resistance at 1KHz) or capacity less than 70% (25℃) of the value when it was fresh. Failure to comply with this requirement shall render GFL warranties under the Contract inapplicable,

thereby releasing GFL from any liability in connection therewith.

5. 应用条件 Application Conditions

客户应当确保严格遵守以下与电池相关的应用条件：

Client shall ensure that the following application conditions in connection with the Products are strictly observed:

5.1 电芯铝壳带正电，不允许任何形式的搭接，导致电芯短路，否则，赣锋锂电不承担质量保护责任。

The aluminum shell of the battery cell is positively charged, and any form of connection is not allowed to cause a short circuit in the battery cell. Otherwise, GFL Battery will not assume quality protection responsibility.

5.2 电芯极柱材质为 AL 1060，上塑胶材质为 PPS；焊接时，注意焊接区域，焊接时位置应在以定位孔为中心 Φ4mm~Φ14mm，深度＜2.5mm 区域，且不允许上塑胶 PPS 熔化，（详见规格书第 9 条），如因焊接不符合上述要求，由此产生的电芯缺陷，赣锋锂电不承担质量保护责任。

The material of the battery cell pole is AL 1060, and the upper plastic material is PPS; When welding, pay attention to the welding area, and the position should be centered around the positioning hole during welding Φ 4mm~ Φ 14mm, depth＜2.5mm area, and plastic PPS melting is not allowed (see Article 9 of the specification). If the welding does not meet the above requirements, resulting in battery cell defects, GFL Electric does not assume quality protection responsibility..

NO	参考参数 Reference parameters	产品规格 product specification
1	极柱尺寸 terminal post	19*19mm
2	极柱焊接区域边界 The boundary of the terminal post welding area	可焊接区域：φ4-φ14mm Weldable area: φ4-φ14mm 最大熔深：2.50mm Maximum penetration depth: 2.50mm 焊接温度 150℃，时间≤5s welding temperature: 150℃，time≤5s 焊接过程中不允许出现极柱塑胶熔融现象 During the welding process, the plastic of the pole posts is not allowed to melt
3	极柱定位孔 Terminal post positioning hole	+Z 方向≤500N +Z dirctions≤500N -Z 方向≤500N -Z dirctions≤500N
4	极柱承受剪切力要求 The requirement for the terminals to withstand shear force	X、Y 方向≤500N X, Y dirctions≤500N
5	极柱承受扭力要求 The requirement for the terminals to withstand torque	≤6N*m
6	模组堆叠力 Module stacking force	瞬间挤压力≤10000N Instantaneous squeezing force≤10000N 稳态预紧力 500-7000N

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		Steady-state preload 500-7000N 建议预紧力 3000±500N Suggested preload 3000±500N
7	对电芯 Busbar 焊接时施加压力 Apply pressure when soldering the Busbar of the battery cell	电芯顶盖可承受的压力规格≤500N The pressure specification that the top cover of the battery cell can withstand≤500N
8	电芯膨胀力 Cell expansion force	电芯膨胀力≤30KN 80%EOL Cell expansion force≤30KN 80%EOL 电芯膨胀力≤40KN 70%EOL Cell expansion force≤40KN 70%EOL

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5.3 客户应在使用中的每个产品附近安装合理数量的热传感器，以感应和测量电池温度。客户应使用该传感器在电池的整个使用寿命内监测和记录电池温度。电池温度是决定客户是否有权根据合同获得 GFL 保证的关键参数。

A reasonable number of thermal sensors shall be installed by Client in proximity each Product in use to sense and measure Cell Temperature. Client shall make use of this sensor to monitor and record Cell Temperature throughout the entire service life of such cell. The Cell Temperature is a critical parameter for determining whether Client shall be entitled to GFL's warranties under the Contract.

5.4 客户应配置电池管理系统，严密监控、管理与保护每个电池。

Client shall procure that each Product shall be used under the strict monitor, control and protection by the Battery Management System to be incorporated by Client.

5.5 客户应向赣锋锂电提供电池管理系统详细的设计方案、系统特点、框架、系统数据、格式等相关信息，以供赣锋锂电对该系统进行设计评估，并建立电池管理档案。

Client shall provide detailed information of the BMS, including but not limited to its design, features, setting, and data file format to GFL for design review and record keeping.

5.6 未经赣锋锂电同意，客户不可擅自修改或者改变电池管理系统的设计和框架，以免影响电池的使用性能。

Once the detailed information of the BMS has been reviewed and agreed by GFL, Client shall not modify or change the design, features, setting or data file format of the BMS without the prior written agreement by Client.

5.7 客户应保存完整的电池运转的监测数据，用作产品质量责任划分的参考。不具备完整的电池系统使用期限内的监测数据的，赣锋锂电不承担产品质量保证责任。

Client shall keep complete records of the BMS monitoring data throughout the entire service life of each Product, including keeping record of number of occurrence of Rush Charge, which will be used in the determination and judgment of any product warranty and liability claim entitlement. No warranty or liability claim will be considered without a complete set of BMS monitoring records capturing the entire service life of the relevant Product.

5.8 电池管理系统需满足以下最基本的检测和控制要求：

The BMS shall include the following monitoring and control features as a minimum requirement.

No.	参数 Parameter	产品规格 Specification	保护动作 Protection Action
5.8.1	充电终止 Stop charging	最大 3.65V 3.65V maximum	当电池的电压达到 3.65V 时终止充电 Stop charging when cell voltage reaches 3.65V
5.8.2	放电终止 Stop discharging	最小 2.50V（＞0℃） Minimum 2.50V (>0 ℃)	当电池的电压到达 2.50V 时终止放电 Stop discharging when the cell voltage reaches 2.50V

5.8.3	放电终止 Stop discharging	最小 2.00V（≤0℃） Minimum 2.00V (≤ 0 ℃)	当电池的电压到达 2.00V 时终止放电 Stop discharging when the cell voltage reaches 2.00V
5.8.4	短路保护 Short circuit protection	不允许短路 No short circuit allowed	发生短路时，由过流器断开电池(电路) Disconnect cell terminals by over-current protector or internal fuse when short circuit occurs
5.8.5	过流保护 Over current protection	参考第 2.3 条放电要求 See paragraph 2.3	电池管理系统控制放电电流符合规格 Limit discharge current by BMS to values within specification
5.8.6	过热保护 Over-temperature protection	参考第 2.2 条和第 2.3 条 See paragraphs 2.2 and 2.3	当温度超过本规格书规定时，终止充电/放电 Stop charging and discharging when temperature exceeds specification
5.8.7	充电容量保护 Charging capacity protection	充电容量≤351.68Ah The charging capacity is ≤351.68Ah	当充电容量达到标称容量的 112%时停止充电 Stop charging when the charging capacity reaches 112% of the nominal capacity
5.8.8	电芯保护温度 Battery cell protection temperature	电池单体高温一级报警温度 80℃ The first-level alarm temperature for high temperature of the battery cell is 80℃ 电池单体高温二级报警温度 79℃ The secondary alarm temperature for high temperature of a single battery cell is 79℃ 电池单体高温三级报警温度 77℃ The three-level high-temperature alarm temperature for a single battery cell is 77℃ 电池单体高温截至温度 75℃ The high-temperature cut-off temperature of the battery cell is 75℃	客户在做模组/电池簇认证时，应注意参考电芯的认证参数表 When customers are conducting module/battery cluster certification, they should pay attention to referring to the certification parameter table of the battery cells.

备注：当电池达到上述任何一项条款描述的指标和参数状态时，意味着电池已超出本技术协议规定的使用条件，客户需依“保护动作”及本技术协议其他相关规定对电池采取保护措施，同时，GFL 声明对上述使用状态的电池质量不承担任何保证责任，并对因此而导致的客户及第三方的任何损失不予赔偿。

When the battery reaches any of the terms described in the above, means that the battery has been used beyond the specifications, the customer shall take protective measures on the battery in accordance with the ‘protection action’ and other relevant provisions of this specification. At the same time, the GFL shall not take any responsibility for the damage in connection therewith.

5.9 避免电池到达过放状态。电池电压低于 2.00V 时，电池内部可能会遭到永久性的损坏，此时赣锋锂电的产品质量保

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证责任失效。根据本规格书第 2.3.3 条，当放电截止电压低于标准放电截至电压时，系统内部能耗降低到最小，并在重新充电之前延长休眠时间。客户需要培训使用者在最短的时间内重新充电，防止电池进入过放状态。

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Prevent draining any Product down to over discharge state. A Product may be permanently damaged internally when the Products voltage is lower than2.00V and therefore should be strictly prohibited, failing which GFL's warranties under the Contract shall cease to apply, thereby releasing the GFL from any liability in connection therewith. After discharge cut-off in accordance with paragraph 2.3.3, internal power consumption of the system should be reduced to a minimum to prolong the idle time before recharge. Client undertakes to educate the users of the Products or other parties who may come to handle the Products to recharge the Products at minimum time intervals to prevent reaching the over discharge state.

5.10 若预计电芯静置时间超过 7 天，静置初始 SOC 需要≥5%，如因静置初始 SOC < 5%且静置时间超过 7 天，造成电芯缺陷，赣锋锂电将不承担质量保护责任；若预计将电池存放 30 天以上的，需要重新配组保证成组一致性；超过 30 天不重新配组对电池造成的自放电差异；赣锋锂电将不承担相关责任；超过三个月应定期（建议每隔 3 个月）做一次完整的充放电，并将 SOC 调整为 25%-40%进行存储（存储条件参考 2.1.7），如因超过 3 个月存储且不做充放电维护对电池造成的容量损失，赣锋锂电将不承担容量损失责任；如因超过 6 个月存储且不做充放电维护对电池造成的电芯缺陷，赣锋锂电将不承担质量保护责任。

If the expected static time of the battery cell exceeds 7 days, the initial SOC of the static state should be ≥ 5%. If the initial SOC of the static state is less than 5% and the static time exceeds 7 days, resulting in battery cell defects, Ganfeng LiEnergy will not assume quality protection responsibility. If the cells are expected to be stored for more than 30 days, they need to be reassembled to ensure consistency within the group. The self-discharge difference of the battery caused by not reassembling for more than 30 days; GFL will not bear any related responsibility. If the battery is expected to be stored for more than 3 months, a complete charge and discharge should be conducted regularly (recommended every 3 months), and the SOC should be adjusted to 25% -40% for storage (refer to 2.1.7 for storage conditions). If the battery loses capacity due to storage for more than 3 months without charge and discharge maintenance, GFL will not be responsible for capacity loss; If the battery cell defects are caused by storage for more than 6 months without charge and discharge maintenance, GFL Battery will not assume quality protection responsibility.

5.11 电池避免在本规格书禁止的低温条件下充电(包括标准充电，快充，紧急情况充电和再生充电)，否则可能出现意外的容量降低现象。电池管理系统应依照最小的充电和再生充电温度进行控制。禁止在低于本规格书规定的温度条件下充电，否则，赣锋锂电不承担质量保证责任。

Prevent charging the Products at a temperature which is not allowed under the specification hereunder (including standard charge, optional fast charge, emergency charge and regeneration), otherwise unnecessary degradation of the capacity of the Products may occur. Follow the specification on minimum charging and regeneration temperature and use the BMS to control it. Charging at temperature lower than the specification hereunder shall render GFL's warranties under the Contract inapplicable, thereby releasing GFL from any liability in connection therewith.

5.12 电箱设计中应充分考虑电芯的散热问题，由于电箱散热设计问题导致的电芯或电池过热损坏，赣锋锂电不承担质量保证责任。

The heat dissipation of the Products should be fully considered in the design of the battery system. Because of the overheating damage of the Products caused by the heat dissipation design of the battery system. GFL will not responsible for quality assurance.

5.13 电箱设计中应充分考虑电芯的防水、防尘问题，电箱必须满足国家有关标准规定的防水、防尘等级。由于防水、防尘问题而导致的电芯或电池的损坏（如腐蚀、生锈等），赣锋锂电不承担质量保证责任。

The problem of waterproof and dust-proof of the battery system should be fully considered. The battery system must meet the waterproof and dust-proof grades stipulated by the relevant national standards. GFL are not responsible for quality assurance due to damages (such as corrosion, rust, etc.) of Products caused by waterproof and dust-proof problems.

5.14 禁止不同 P/N 料号电芯在同一电池系统（或整车）中混用，否则，赣锋锂电不承担质量保护责任。

It is forbidden to mix different P/N Products in the same battery system (or vehicle), otherwise GFL will not responsible for quality protection.

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6. 安全防范 Safety Precautions

6.1 禁止将电池浸入水中。Do not immerse cells into water.

6.2 禁止将电池投入火中或长时间暴露在超过本规格书的温度条件的高温环境中，否则可能会导致火灾。在任何正常的使用，存储情况下，电芯温度不能超过 65℃，如果电池中电芯温度超过 65℃，电池管理系统需关闭电池，停止电池运行。

Do not drop cells into fire or expose them to any high temperature environment exceeding operation temperature as set out in the specification, otherwise fire hazards may present. At all time, cell temperature should not exceed 65℃, shut down system by BMS when it occurs.

6.3 禁止电池正负极短路，否则强电流和高温可能导致人身伤害或者火灾。由于电池的正负极暴露于塑料保护套中，在电池系统组装和连接时，应有足够的安全保护，以避免短路。

Do not short circuit cell terminals, otherwise high current and temperature may cause body injury or fire hazards. Metallic cell terminals are exposed from plastic packaging and ample safety precautions should be implemented to avoid short circuiting them during system integration or connections.

6.4 严格按照标示和说明连接电池正负极，禁止反向充电。

Always connect cell terminals according to its label(s) in right polarity. Reverse charging is strictly prohibited.

6.5 禁止电池过充，否则，可能引起电池过热和火灾事故的发生。在电池安装和使用中，硬件和软件需实行多重过充失效安全保护。最低保护要求见本规格书第 5.8.1 条和第 6.11 条。

It is extremely dangerous to overcharge a cell which may cause overheating and fire hazards. Multiple level of fail safe overcharge protection should be implemented in a BMS. See paragraph 5.8.1 for minimum requirement to be adopted by the BMS for protection. See also paragraph 6.11.

6.6 根据本规格书第 5.8.7 条充电后，应结束正常充电。当持续充电时间超过合理的时间限制,电池会出现过热现象可能会引起热失控和火灾。应安装上一个定时器加以保护。一旦充电容量达到过充状态而不能终止，定时器将会起作用从而终止充电，见本规格书第 6.11 条。

Normal charging should finish within a charging time out limit as set out in paragraph 5.8.7. When charging continues longer than charging time out limit, it tends to overheat the cells which may cause overheating and fire hazards. A timer should be implemented in the charger circuit and set up properly. In case charging does not terminate normally within charging capacity out limit, ensure that the timer will intervene and stop the charging. See also paragraph 6.11.

6.7 客户应将电池安全地固定在固体平面上，并将电源线安全地束缚在合适的位置，以避免摩擦而引起电弧和火花。

Products should be securely fixed to solid platform, and power cables should be securely attached by fastener to avoid intermittent contact which may cause arcing and sparks.

6.8 严禁用塑料封装电池或用塑料进行电气连接。不正确的电气连接方式可能会造成电池使用过程中发生过热现象。

Do not service cells and electrical connections within plastic package of cell. Improper electrical connection within a cell may cause overheating in service.

6.9 当发现电池有电解液泄露时，无关人员立即撤离泄露区，同时，应避免皮肤和眼睛接触电解液。此外，技术人员应穿戴防护用品，如防毒口罩、耐酸手套、防护服等，并切断电源，现场保持通风状态；搭建防护屏障，隔离泄漏现场，使用黄沙、吸附棉等物资对泄漏液体进行处理，防止其进一步扩散，并对受污染的土壤进行固化、稳化处理；将处理后的泄漏液体装入密闭容器中，标注泄漏物质的名称、危险级别、处理时间和责任人，交给有资质的危险废弃物处置单位处理，所有废弃物按危险废物处置。若在泄露的过程中有接触眼睛和皮肤，应使用大量的清水冲洗并向医生寻求帮助。在处理泄露事故时，应远离火源至少 5m 的距离。

When electrolyte leakage is found in the battery, irrelevant personnel should immediately evacuate the leakage area. At the same time, skin and eye contact with the electrolyte should be avoided. In addition, technicians should wear protective equipment such as gas masks, acid-resistant gloves, and protective suits, cut off the power supply, and keep the site well-ventilated. Build protective barriers to isolate the leakage site, use materials such as yellow sand and adsorption cotton to treat the leaked liquid to prevent its further spread, and carry out solidification and stabilization treatment on the contaminated soil. The treated leaked liquid should be filled into a sealed container, with the name of the leaked substance, the level of danger, the treatment time and the person responsible marked. It should be handed over to a qualified hazardous waste disposal unit for treatment. All waste should be disposed of as hazardous waste. If the leakage process comes into contact with eyes and skin, rinse the affected area with plenty of water and seek medical help.

When dealing with writing leakage accidents, one should keep at least 5 meters away from the fire source.

6.10 尽力保护电池，使其免受机械震动、碰撞及压力冲击，否则电池内部可能短路，产生高温和火灾。

Protect cells from mechanical shock, impact and pressure. Internal electrical circuit may short circuit to generate high temperature and fire hazards.

6.11 电池充电过程中可能发生不适当的终止充电现象。如：超出允许的充电时间充电，充电电压过高而终止充电或充电电流过强而终止充电。上述现象被定义为"不适当的终止充电"。当发生以上现象时，可能意味着电池系统出现漏电或某些部件出现故障。在没有找到根本原因并彻底解决之前继续对该电池充电可能会引起电池过热或发生火灾。当发生以上现象时，电池管理系统应该通过自动锁定功能，禁止后续的充电，并提醒使用者将装载有该电池的交通工具退回到经销商处进行系统维护。该电池只有经过有认证资格的技术人员全面检查，确定根本原因并彻底解决、改善后方可恢复充电。

When cells charging is terminated improperly for reasons such as exceeding allowable charging time, cut-off due to exceeding charging voltage or cut-off due to exceeding charging current, all these events are defined as 'improper charge termination'. Such event may indicate that there is current leaking within a cell system or some components have started to malfunction and subsequent charging of such cell system without finding and fixing root cause of problem may cause potential overheat or fire hazards. When such event occurs, the BMS should lock itself up to prevent subsequent charging and notice should be given to the user to return the vehicle to dealer for servicing. Subsequent charging should only be resumed after the system has been thoroughly checked by qualified technician who can identify and fix root cause attributed to the 'improper charge termination'.

6.12 电芯测试实验如操作不当可能会引起电池起火或者爆炸。该测试实验只能由配备适当的防护装备的专业人员在专业的实验室进行。否则，可能会导致严重的人身伤害和财产损失。

Performing tests may result in fire or explosion of the Products. Such tests shall only be performed in qualified laboratories by qualified personnel with proper safety precautions taken. Running these tests in an improper way may result in severe personal body injury or property damages.

6.13 严禁使用没有 BMS 或类似系统的电池。

The usage of the cells without a BMS or similar System is strictly prohibited.

7. 免责声明 Disclaimer

7.1 如果由于产品需要单位不按本说明书中的规定进行使用，造成社会性影响，并对赣锋锂电的声誉造成影响的，赣锋锂电将会追究需求单位的责任。根据对赣锋锂电造成的影响程度，产品需求单位需向赣锋锂电提供赔偿。

7.1 If the product demand company is not used according to the regulations in the specification, the social influence is caused, and the reputation of the GFL is influenced, the GFL will be investigated for the responsibility of the requirement unit. According to the degree of influence on the GFL, the product demand company needs to provide compensation for the GFL.

7.2 赣锋锂电保留对产品的规格及性能参数修改的权利。买方在订购赣锋锂电产品前，需要与赣锋锂电提前确认产品的最新状态。

7.2 GFL reserves the right to modify the specifications and performance parameters of the product. The buyer needs to confirm the latest status of the GFL in advance before ordering the GFL product.

7.3 GFL 电芯规格书仅对电芯层级的符合性，模组或系统层级的安全符合性，需要客户设计验证。

7.3 The GFL cell specification sheet only stipulates the compliance at the cell level. The safety compliance at the module or system level requires customer design verification.

7.4 英文规格释义仅供参考，请以中文版技术规格要求为准。

7.4 English specifications are for reference only. Please refer to the technical specifications of the Chinese version.

7.5 不允许对电芯顶盖进行敲击，导致漏液及其他问题，赣锋不承担相关责任。

7.5 It is not allowed to strike the top cover of the cells. If leakage or other problems occur, GFL's will not be held responsible.

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8. 风险警告 Hazard Warning

8.1 警示声明 Warning statement

警 告 WARNING

电池存在潜在的危险，在操作和维护时必须采取适当的防护措施！CELLS ARE POTENTIALLY DANGEROUS AND PROPER PRECAUTIONS MUST BE OBSERVED IN HANDLING AND MAINTENANCE.

不正确地操作本规格书第 2.6 条所描述的测试实验，可能导致严重的人身伤害和财产损失！RUNNING TESTS ON THE CELLS IMPROPERLY MAY RESULT IN SEVERE PERSONAL BODY INJURY OR PROPERTY DAMAGES.

必须使用正确的工具和防护装备操作电池。WORK ON CELLS MUST BE PERFORMED ONLY WITH PROPER TOOLS AND PROTECTIVE EQUIPMENT MUST BE USED.

电池的维护必须由具有电池专业知识并经过安全培训的人士执行。CELL MAINTENANCE MUST BE CARRIED OUT BY PERSONNEL KNOWLEDGEABLE OF CELLS AND TRAINED IN THE SAFETY PRECAUTIONS INVOLVED.

不遵守上述警告可能造成多种灾难。FAILURE TO OBSERVE THE ABOVE MAY CAUSE VARIOUS HAZARDS.

8.2 危险类型：Types of Hazards

客户知悉在电池使用和操作过程中存在以下潜在的危险：

Client acknowledges the following potential hazards in connection with the usage and handling of the Products.

8.2.1 操作者在操作时可能会受到化学品、电击或者电弧的伤害。尽管人体对遭受直流电与交流电的反应不同，但是高于 50V 的直流电压与交流电对人体的伤害是同样严重的，因此客户必须在操作中采取保守的姿势以避免电流的伤害。

8.2.1 Working with battery can expose the handler to chemical, shock and/or arcing hazards. Although a person's body might react to contact with direct current voltage differently than from contact with alternate current voltage, Client shall take a conservative position and consider the risk of shock or electrocution to be the same for both alternate current and direct current exposures greater than 50 volts.

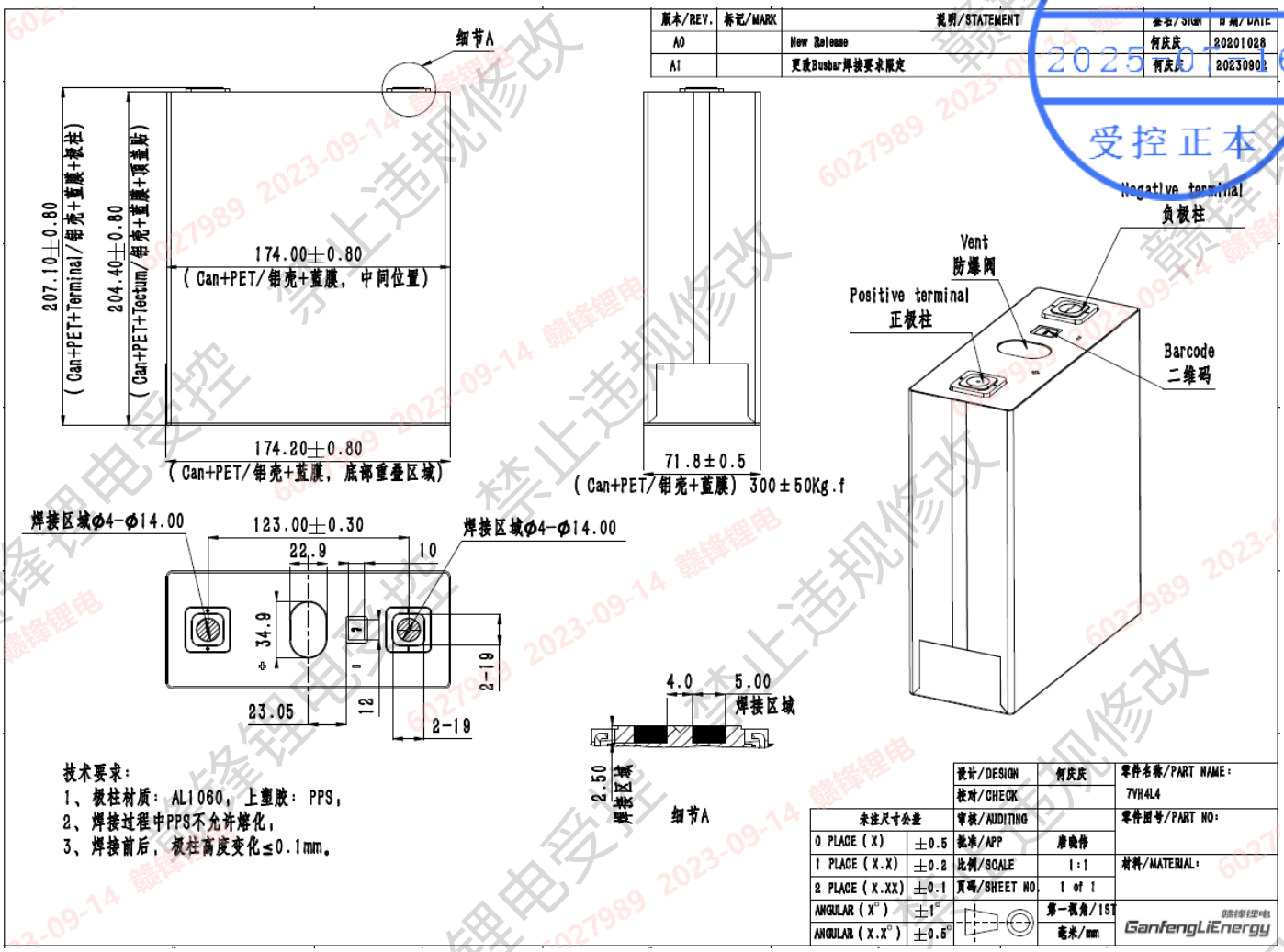
8.2.2 存在来自电池中的电解液的化学风险。

8.2.2 Cells expose its handler to chemical hazards associated with the electrolyte used in the cell.

8.2.3 在操作电池和选择个人防护装备时，客户及其雇员必须考虑到以上潜在的风险，防止发生意外短路，造成电弧、爆炸或热失控。

8.2.3 When selecting work practices and personal protective equipment, Client and its employees shall consider potential exposure to these hazards and therefore prevent accidental short-circuit that can result in electrical arcing, explosion, and/or 'thermal runaway' of the cells.

9. 电芯图纸 Mechanical Drawing



版本/REV.	标记/MARK	说明/STATEMENT	签名/SIGN	日期/DATE
A0		New Release	何庆庆	20201028
A1		更改Busbar焊接要求限定	何庆庆	20230901

未注尺寸公差		设计/DESIGN	何庆庆	零件名称/PART NAME：
		校对/CHECK		7VH4L4
		审核/AUDITING		零件图号/PART NO：
0 PLACE (X)	±0.5	批准/APP	唐晓伟	
1 PLACE (X.X)	±0.2	比例/SCALE	1:1	材料/MATERIAL：
2 PLACE (X.XX)	±0.1	页码/SHEET NO.	1 of 1	
ANGULAR (X°)	±1°		第一视角/1ST	
ANGULAR (X.X°)	±0.5°		毫米/mm	GanfengLiEnergy

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术语定义 Definition and Note

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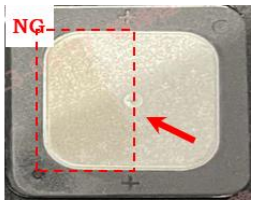
术语 Terms	定义 Definition / Note
产品 Product	本规格书中的“产品”是指赣锋锂电生产的 314Ah 3.2V 可充电磷酸铁锂体系动力电池。Means the 314Ah 3.2V rechargeable lithium ion cells produced by GFL.
客户 Client	指《GFL 产品销售合同》中的买方。 Means the customer in the 《GFL product sales contract》.
赣锋锂电 GFL	指江西赣锋锂电科技股份有限公司。Means Ganfeng Li-Energy Technology Co. Limited.
成品代码 PN	为了区别电池应用于不同的使用区域或不同的应用条件下,赣锋锂电为 314Ah 3.2V 可充电锂电池定义的物料编号。Means the unique part number provided by GFL to identify the product supplied by GFL.
周围环境温度 Ambient Temperature	电池所处的周围环境温度。Means the ambient temperature of the environment which the products are exposed.
电池管理系统（BMS）	客户用于监测和记录产品在整个服务期限内的运行参数的一种有效的追踪和控制系统。其追踪和记录的参数包括但不限于电压、电流、温度等，以控制产品的运行并确保产品运行环境及运行条件符合本规格书的规定。Means an active tracking and control system to be developed and implemented by GFL to monitor and record the operating parameters, including but not limited to voltage, current and temperature, of each product in its entire service life, and to control the operation of each product to ensure a safe operation of product.
电芯温度 Cell Temperature	由接入电池的温度传感器测量的电芯大面温度。Means the temperature of the cell measured by the temperature sensor connected to the main part of cell.
充电倍率 Charge C-Rate	充电电流与电池管理系统多次测量的电池的容量值的比率。例如：电池容量为 314Ah，充电电流为 62.8A 时，则充电倍率为 0.2C；充电电流应根据最新电池容量不时进行调整，以便充电倍率符合 2.2 中规定的要求。The ratio of charging current to the latest cell capacity as frequently measured by the Battery Management System, with a unit of measure denoted by ‘C’. For example, the initial cell capacity is 314Ah and a Charge C-Rate of 0.2C equals to a charge current of 62.8A. The charge current shall be adjusted from time to time based on the latest cell capacity so that the Charge C-Rate complies with the requirement as set out in paragraph 2.2.
循环 Cycle	电池按规定的充放标准充放一次为一个循环。充电可以由一些部分充电组合在一起形成。放电可以由一些部分放电组合在一起形成。Means a state when a total of charge and discharge according to rules from a cell as recorded by BMS and it may consist of a summation of a few segments of partial charge and discharges.
生产日期 Production date	电池的制造日期。每个相关的电池的顶端贴纸上标示的明确的日期代码为制造日期。Date of battery manufacture. The clear date code on the top cap of each related battery is the manufacturing date.
开路电压（OCV）	没有接入任何负载和电路时测得的电池的电压。Open circuit voltage.
标准充电 Standard Charge	本规格书第 2.2.4 条所述的充电模式。The default charging method set out in paragraph 2.2.4.
标准放电 Standard Discharge	符合本规格书第 2.3.1 条所述的放电电流或放电功率以及本规格书第 2.3.3 条所述的电压的放电模式。A discharge current of 0.5C or discharge power of 0.5P as set out in paragraph 2.3.1 with a discharge cut-off voltage of 2.50V or 2.00V as set out in paragraph 2.3.3.

充电状态 (SOC)	在无负载的情况下，以安培小时或者以瓦特小时为单位计量的电池充电容量状态的所有的线性关系。如：若将电芯满充至 3.65V 视为 100%SOC，电芯满放至 2.50V 视为 0%SOC。The linear scale of charge held by a cell as measured by capacity either in Ah or Wh. 100% SOC means a cell is fully charged at 3.65V while 0% SOC means a cell is fully discharged down to 2.50V. The SOC should indicate a no load situation.
温度上升 Temperature Rise	在本技术协议规定的条件如充电过程或者放电过程中电芯温度的升高。Means the temperature of the cell rises during the conditions specified in this document, such as the charging process or the discharging process.
新鲜电池 Fresh cell	指客户到货 7 天内的且未使用的产品。Refers to products that have been received by the customer within 7 days and have not been used
测量单位 Unit of measurement	“V” (Volt) 伏特(V)，电压单位 “A” (Ampere) 安培(A)，电流单位 “Ah” (Ampere-Hour) 安培-小时(Ah)，负荷单位 “Wh” (Watt-Hour) 瓦特-小时(Wh)，能量单位 “Ω” (Ohm) 欧姆(Ω)，电阻单位 “mΩ” (Milliohm) 毫欧姆(mΩ)，电阻单位 “℃” (Degree Celsius) 摄氏度(℃)，温度单位 “mm” (Millimeter) 毫米(mm)，长度单位 “s” (Second) 秒(s)，时间单位 “Hz” (Hertz) 赫兹(Hz)，频率单位

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成品电芯外观标准 Appearance Standard

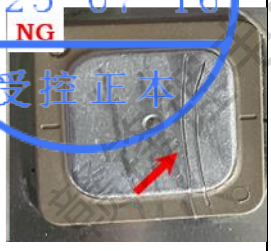
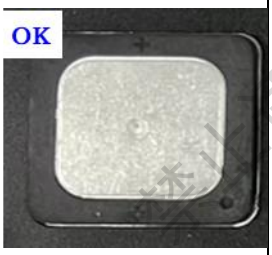
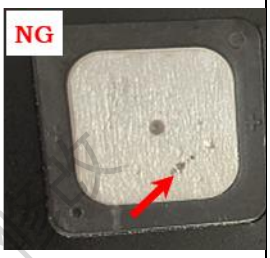
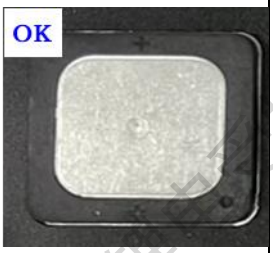
缺陷名称	检验标准	OK 样品图片	限度样品	NG 样品图片
极柱污渍/氧化	1、极柱表面脏污、氧化异色、污渍或电解液残留，不允许。 1. Dirty, oxidized foreign color, stains or electrolyte residue on the surface of the pole is not allowed. 2、打磨清洁极柱残留的清洁溶剂印记，可接收。 2. Cleaning solvent marks on the residue of the polished cleaning pole are allowed to be accepted. 3、极主色差占极柱总面积 1/3 大小，可接收。 3. Pole color difference accounting for about 1/3 of the total area of the pole can be accepted.			
极柱烧伤	1、极柱 PPS 塑胶烫伤、烧伤，不允许。 1. Pole PPS plastic burns are not allowed to be accepted.		NA	
极柱开裂/缺胶	1、极柱 PPS 塑胶表面条痕（合模印），无开裂现象，可接收。 1. Pole PPS plastic surface streaks (moulded impressions) without cracking can be accepted. 2、极柱 PPS 塑胶出现开裂，且贯穿 PPS 胶极柱高度，不允许。 2. Pole PPS plastic cracked through the height of the pole is not allowed to be accepted..		NA	

极柱熔胶	The pole PPS plastic surface has a melting glue. 1、 极柱 PPS 塑胶表面有熔胶，熔胶高度不超过极柱高度，可接收。 1. The melting glue height does not exceed the pole height is allowed to be accpeted. 2、 极柱 PPS 塑胶表面有熔胶，熔胶高度超过极柱高度≥0.5mm，不允许。 2. The melting glue height exceeding the pole height ≥0.5mm is not allowed to be accepted.			
极柱缺少定位孔	1、正负极柱中心位置无定位孔，不允许。 1、There is no positioning hole at the center of the positive and negative poles, which is not allowed		NA	
极柱腐蚀	1、电解液残留在极柱表面结晶，形成污染层，不允许。 1、Electrolyte residue on the surface of the pole to form crystals and then form a contamination layer is not allowed to be accepted. 2、非焊接区点状腐蚀及侧面台阶腐蚀，边缘往定位孔方面≤3mm 距离，可接收。 2、Pitting corrosion in non-welded areas and lateral step corrosion with ≤ 3mm distance from the edge towards the locating hole is acceptable. 3、极柱腐蚀允许打磨光滑，清洁极柱定位孔内异物后，可接收。 3、Pole corrosion permits sanding smooth and cleaning the pole positioning holes of foreign object.Acceptable			

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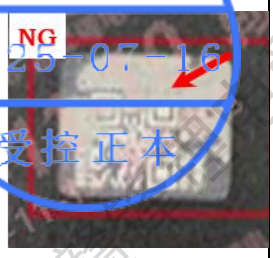
极柱划痕	1、因极柱与其它物体刮擦受力形成划痕无手感，可接收。 1、Because the pole column and other objects scraping force formation of scratches without hands feeling, can be received。 2、划痕、充放电柜探针压印，允许细砂纸打磨至无手感，可接收。 2、Scratches, charge/discharge cabinet probe indentations, allow fine sandpaper to be sanded to without hands feeling, acceptable			
极柱面凹点/凹坑	1、极柱与其他物体接触受力形成的凹点/凹坑，无手感，可接收。 1、Dimples/pits formed by the force of the pole in contact with other objects, Without hands feeling,Acceptable 2、凹点/凹坑不平整，允许细砂纸打磨至无手感，可接收。 2、Unevenness of dents/pits, allow fine sandpaper to be sanded to no hands feeling, acceptable.			
极柱缺口	1、极柱面边缘往中心方向缺口尺寸≤1.5mm，宽度≤2mm，缺口 1 个，可接收。 1、Notch size from the edge to the center of the pole face ≤1.5mm, width ≤2mm, 1 notch, acceptable。 2、极柱非焊接区缺口，无翻边凸起≤0.5mm，可接收。 2、Pole non-welding area notch, no flap bulge ≤ 0.5mm, acceptable.			

极柱壳体打磨	1、针对污染等缺陷使用砂纸打磨返工处理时，在极柱或壳体上留下打磨痕迹，无手感，可接收。 1、For contamination and other defects in the use of sandpaper sanding rework processing, in the pole column or shell to leave sanding marks, no hands feeling, acceptable. 2、打磨后极柱表面及极柱焊接区域（极柱孔内）有金属屑等残留，无手感，不允许。 2、Metal shavings and other residues on the surface of the pole and in the pole welding area (inside the pole hole) after grinding, No hands feeling, are not permitted.		NA	
极柱边缘蓝膜突起	1、蓝膜留边过长导致极柱边缘蓝膜突起，不超过塑胶上表面，可接收。 1、The blue film is left too long resulting in a protruding blue film on the edge of the pole, not exceeding the upper surface of the plastic, which is acceptable.		NA	
二维码偏移	1、顶盖贴未覆盖二维码图形但覆盖数字可顺利扫码，可接收； 1、The top cover sticker does not cover the QR code graphic but covers the numbers can be scanned smoothly and can be received； 2、顶盖贴覆盖二维码图形及印字且影响扫码，不允许。 2、Top cover stickers that cover the QR code graphics and printing and affect the scanning of the code are not allowed.。			

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二维码脏污/污染	1、二维码表面有残胶或其他异物，不允许； 1、Residual adhesive or other foreign object on the surface of the QR code is not permitted； 2、二维码表面有电解液腐蚀印记，能清晰辨识图文与顺利扫描，可接收。 2 、 The surface of the QR code has electrolyte corrosion marks, which can clearly recognize the graphic and smooth scanning, and can be received.			
二维码模糊	1、二维码文字模糊、重影无法识别、扫描不上，不允许； 1 、 QR codes with fuzzy text, ghosting unrecognizable, not scannable, not allowed;			
二维码划伤	1、二维码因受外力影响出现的划痕、压伤且影响扫码，不允许 1 、 The QR code is not allowed to be scratched or crushed due to external force and it affects the scanning of the code.			
二维码缺字	1、二维码数字明码残缺，不影响扫码，可接收。 1、QR code digital plain code mutilated, does not affect the scanning code, can be received. 2、图形暗码与数字明码不一致，不允许。 2、The graphic cipher does not match the numeric plain code and is not allowed.			
防爆阀破损	1、防爆阀受外力影响，出现破损或开裂现象，不允许。 1 、 Explosion-proof valves subjected to external forces, breakage or cracking phenomenon is not allowed to。		NA	

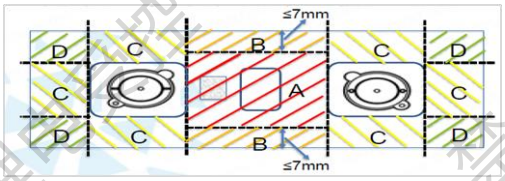
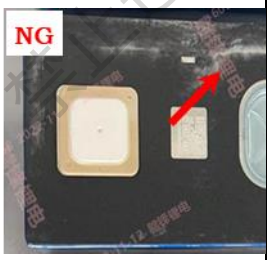
防爆阀凹陷/凸起	1、防爆阀尖锐凹陷或凸起，不允许。 1 、 Sharp depressions or bumps in explosion-proof valves are not permitted. 2、防爆阀非尖锐物凹陷或凸起，非防爆阀刻痕处，可接收。 2、Explosion-proof valves non-sharp objects dented or raised, non-explosion-proof valves engraved at the place, can be received.			
防爆阀腐蚀	1、电芯防爆阀有电解液腐蚀现象形成白色结晶，不允许。 1、Cell explosion-proof valve has electrolyte corrosion phenomenon to form white crystals, not permitted。		NA	
防爆阀污渍	1、防爆阀表面有液体残留，使用无尘布擦拭后无残留，可接收。 1、The surface of the explosion-proof valve has liquid residue, no residue after wiping with a dust-free cloth, Acceptable。 2、防爆阀表面脏污，使用无水乙醇擦拭可祛除无腐蚀迹象，可接收。 2、Explosion-proof valve surface dirty, use anhydrous ethanol wipe can be removed without signs of corrosion, Acceptable。 3、防爆阀表面电解液结晶呈灰黑色残留，不允许。 3、Explosion-proof valve surface electrolyte crystals gray-black residue，Not Allowed。			

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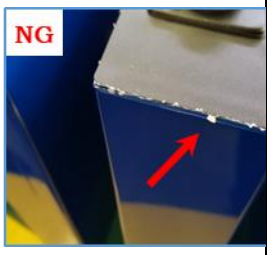
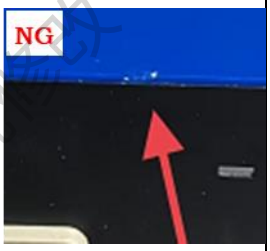
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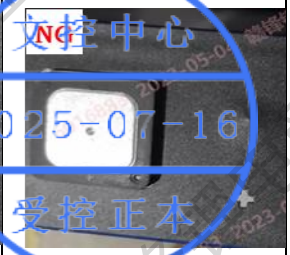
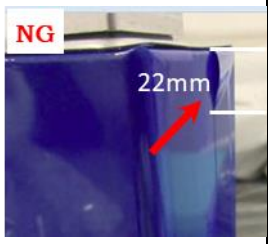
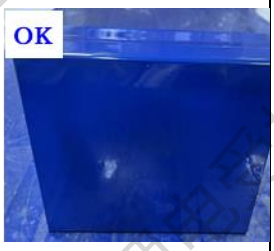
防爆阀内异物	1、胶状异物可接收；丝状、絮状异物≤3 处，片状异物≤0.5mm x 0.5mm 可接收。 1 、 Gelatinous foreign matter can be accepted; filamentous and flocculent foreign matter ≤ 3 places, flaky foreign matter ≤ 0.5mm x 0.5mm can be accepted.。 2、防爆阀内部有电解液腐蚀痕迹，焊渣及其他异物不允许。 2、Traces of electrolyte corrosion, weld slag and other foreign matter inside the explosion-proof valve are not permitted。		NA	
防爆阀 PP 膜缺失	1、防爆阀 PP 膜缺失不允许； 起翘翻折不超过圆弧区，高度≤1mm，允许。 1、Explosion-proof valve PP film missing is not allowed; warping and folding does not exceed the arc area, the height of ≤ 1mm, permitted。			
防爆阀 PP 膜歪斜	1、防爆阀 PP 膜歪斜，偏移导致下方铝箔露出，不允许。 1、Explosion-proof valve PP film is skewed and deflected resulting in exposure of the aluminum foil underneath, not permitted.			
防爆阀 PP 膜脏污	1、防爆阀 PP 膜上有涂画痕迹或其它污染物，不允许。 1、Traces of painting or other contaminants on the PP film of the explosion-proof valve are not permitted。		NA	
防爆阀 PP 膜破损	1、防爆阀 PP 膜破损露出底下铝箔，不允许。 1、Explosion-proof valves with broken PP film exposing the aluminum foil underneath are not allowed.		NA	

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顶贴片翘起	A 区域：不允许起翘 Area A：No warping allowed B 区域：起翘高度≤1.5mm Area B：Warping height≤1.5mm C 区域：起翘高度≤2mm Area C：Warping height≤2mm D 区域：起翘高度≤4mm Area D：Warping height≤4mm 图示见右图 The figure is shown on the right 			
顶贴片褶皱/破损	1、顶贴片受力变形，形成褶皱有不可复原折痕，不允许。 1、The top patch is deformed by force, forming folds with irretrievable creases, and is not permitted.。 2、顶贴片出现破损，露出盖板≥1.5mm，不允许。 2、The top patch appears broken, exposing the cover plate ≥ 1.5mm, not permitted。			
顶贴片脏污	1、顶盖贴表面有脏污、异物，不允许。 1、Dirty or foreign matter on the top cover sticker surface is not permitted。 2、顶盖表面脏污、异物擦拭干净后无残留，可接收。 2、The surface of the top cover can be wiped clean without residue after wiping and can be received。			

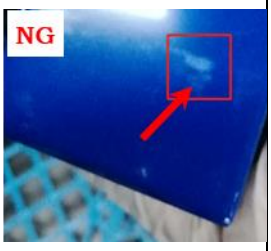
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顶贴片偏移	1、顶盖贴张贴位置偏移与极柱边缘干涉，不允许； 1、The offset of the top cover posting position interferes with the edge of the poles and does not allowed; 2、顶盖贴超出电芯边缘≥1mm，不允许。 2、Top cover stickers exceeding the edge of the core by ≥1mm are not allowed.			
顶贴片粘附泡沫颗粒	1、电芯打包时泡沫颗粒粘附在顶贴片及蓝膜上，不允许。 1、Foam particles adhered to the top patch and blue film when the cell was packed and were not allowed to。		NA	
焊缝翻边	1、焊线向外偏移≤0.12mm(以邻近焊线为基准)允许接收； 1、Weld line outward offset ≤ 0.12mm (based on neighboring weld line) allowed to receive; 2、焊线小凸点≤0.12mm 允许接收 (不允许有尖锐的凸点)。 2、Welding line small bump ≤ 0.12mm allowed to receive (sharp bumps are not allowed)。		NA	
顶盖上方熔珠/凸起	1、顶盖焊接时因能量波动产生熔珠，不允许。 1、Molten beads due to energy fluctuations during welding of the top cover are not allowed。 2、顶盖焊接起始位置熔珠高度≤0.5mm 且不可移动，可接收。 2、The top cover welding starting position of the melt bead height ≤ 0.5mm and can not be moved, Acceptable。			

密封钉焊接台阶/翘钉	1、密封钉台阶高度≤0.3mm，可接收； 1、Sealing nail step height ≤ 0.3mm, acceptable； 2、密封钉焊接尖锐焊渣凸起，不允许。 2、Sealing nails weld sharp weld slag protrusion, not allowed。			
蓝膜翘起	1、蓝膜与蓝膜粘结不紧密，脱开距离>20mm，翘起高度≥5mm，不允许。 1、Blue film and blue film bonding is not tight, disengagement distance >20mm, warping height ≥5mm, not allowed。 2、侧面蓝膜除距电芯顶面 20mm 和距电芯底面 20mm 的位置允许有不大于 20mm 长的开胶外，侧面其余位置不允许有蓝膜开胶现象。 2、In addition to the blue film on the side, except for the position of 20mm from the top surface of the cell and 20mm from the bottom surface of the core, there is allowed to have a no more than 20mm long open glue, the rest of the side is not allowed to have the blue film open glue phenomenon.			
蓝膜折角翘起	1、电芯底部侧边折尾胶翘起，不允许。 1、The bottom side of the cell is warped by the folded end adhesive.，Not Allowed。 2、三层蓝膜重叠处无胶区缝隙高度≥3mm，不允许。 2、The seam height of the unglued area at the overlap of the three layers of blue film ≥ 3mm，Not Allowed。			

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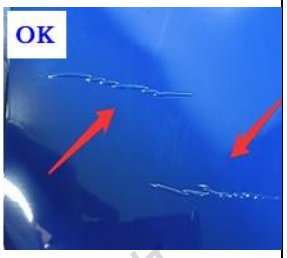
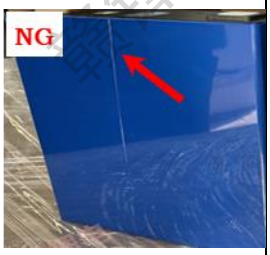
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蓝膜破损	1、蓝膜破损贯穿露出壳体，不允许； 1、The blue film breaks through to expose the shell and does not allowed； 2、蓝膜刮擦局部发白未破损，且绝缘测试合格，可接收。 2、Blue film scratches localized white not broken, and insulation test qualified, can be accepted。			
蓝膜发白	1、蓝膜发白（实为涂胶不均匀）未破损，且绝缘测试通过，可接收。 1、Blue film whitening (actually uneven glue application)and not broken, and the insulation test is passed, can be accepted.		NA	
蓝膜气泡	1、侧面除距电芯顶面 20mm 和距电芯底面 20mm 的位置允许有气泡，侧面其余位置不允许有尺寸超过 5mm 的气泡。 1、Side except from the top surface of the core 20mm and 20mm from the bottom surface of the cell is allowed to have air bubbles, the rest of the side of the position is not allowed to have the size of more than 5mm air bubbles. 2、大面 < 5mm 的气泡不作管控要求，宽度>20mm 不允许；宽度≤20mm 允许 5EA/面 2、Large surface <5mm bubbles are not required for control, width >20mm is not allowed; width ≤20mm is allowed to be 5EA/surface. 3、底面大于 15mm 不允许，小于 5mm 不管控，≤15mm 允许 3EA/面。 3、The bubble in bottom surface is more than 15mm not allowed, less than 5mm regardless of control, ≤ 15mm allows 3EA / surface.			

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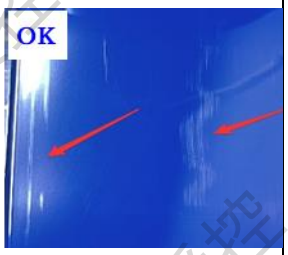
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蓝膜褶皱	1、侧面蓝膜除距电芯顶面 20mm 和距电芯底面 20mm 的位置允许有褶皱，侧面其余位置褶皱长度不允许有超出 15mm； 1、The blue film on the side is allowed to have folds except for the positions 20mm from the top surface of the core and 20mm from the bottom surface of the core, and the length of the folds on the rest of the side is not allowed to be longer than 15mm; 2、大面褶皱宽度≤5mm，距离顶盖焊缝 20mm 以下，皱褶长度＜壳体电芯长度，数量≤2ea/面允许接收。 2、Large surface fold width ≤ 5mm, less than 20mm from the welding seam of the top cover, fold length < shell core length, quantity ≤ 2ea/face are allowed to receive. 3、侧面蓝膜重叠区起翘褶皱长度≤20mm，可接收。 3、Side blue film overlap area buckling fold length ≤ 20mm, can be received.			

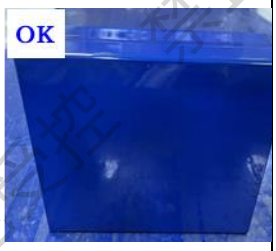
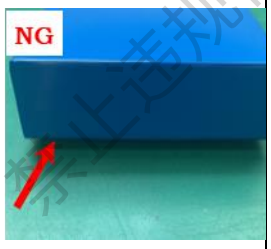
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蓝膜内异物	1、膜内有尖锐异物或硬质异物不允许，软质异物允许。 1、Sharp foreign objects or hard foreign objects in the Film are not allowed, soft foreign objects are allowed。 2、侧面、底面不允许尺寸＞2mm×2mm，高度＞0.5mm 的软质异物。 2、Side and bottom surfaces do not allow soft foreign objects with dimensions >2mm x 2mm and height >0.5mm.。 3、大面包膜软质异物：5mm≤直径≤10mm，超过 5 处，不允许。 3、Front Surface Film soft foreign object: 5mm ≤ diameter ≤ 10mm, more than 5 places, not allowed. 软质硬质判断标准：大面采用 300Kgf 的压力压（此项在电芯端测量尺寸时同步施压），如果异物对应位置蓝膜没有发白，则确定为软质异物，如果发白则为硬质异物。 侧面异物：用手按压，如对应位置蓝膜没有发白，则可确定为软质异物，如发白则为硬质异物 Soft and hard judgment standards: Front surface using 300Kgf pressure pressure (this in the core end of the measurement of the size of the synchronization of pressure), if the corresponding position of the foreign object of the blue film does not whiten, it is determined to be a soft foreign object, if whitening is a hard foreign object. Side foreign object: press with your hand, if the corresponding position of the blue film does not whiten, it can be identified as a soft foreign object, such as whitening is a hard foreign object			

蓝膜表面水珠	1、蓝膜表面有水珠或液体残留，不允许。 1、Water droplets or liquid residue on the surface of the blue film are not allowed to。 2、将电芯蓝膜表面水珠或液体擦拭干净、无残留，可接收。 2、Wipe the water droplets or liquid on the surface of the blue film of the electric core clean and free of residue, Acceptable.		NA	
蓝膜表面污物	1、蓝膜本身以外的污物，不允许。 1、Fouling outside of the blue film itself is not allowed.		NA	
蓝膜表面花纹/波浪纹	1、蓝膜本身存在的花纹、波浪纹、色差等，无手感，可接收 1、Patterns, wavy lines, color differences, etc. in the blue film itself，No Feeling in Hands，Acceptable			NA
蓝膜条状痕迹（花纹）	1、蓝膜表面呈现的条状痕迹（包括但不限于焊缝、棱边因与蓝膜粘贴不良，色差等呈现的痕迹）无手感、无发白允许 1、Stripes appearing on the surface of the blue film（Including,but not limited to, weld seams, edges due to poor adhesion to the blue film, color differences and other traces presented） No Feeling in Hands, No whitening allowed 2、蓝膜表面因与托盘接触而呈现刮擦痕迹，无破损且绝缘合格，可接收 2、Scratch marks on the surface of the blue film due to contact with the pallet，No breakage and qualified insulation，Acceptable			

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凹陷/压伤	1、大面：凹陷深度≤ 0.5mm，长度＜15mm，区域≤2 处，非尖锐凹陷可接收。 1、Front Surface：Depth of depression ≤ 0.5mm, length <15mm, area ≤ 2, non-sharp depression acceptable。 2、侧面：凹陷/凹坑直径≤15mm，单面数量≤2 个，深度≤0.5mm，不允许有尖锐凹点； 2 、 Lateral side： The diameter of the depression / pit ≤ 15mm, the number of single side ≤ 2, depth ≤ 0.5mm, do not allow sharp concave point； 3、棱边：数量≤2 个，直径≤8mm，深度≤0.5mm，不允许有尖锐凹点；(棱边：电芯棱边侧面距离平面 4mm 以内) 3、Edge：Quantity ≤ 2, diameter ≤ 8mm, depth ≤ 0.5mm, sharp dents are not allowed; (Ribs: within 4mm from the plane of the edge of the core)			
漏液腐蚀	1、电芯表面因化学反应而产生的铝壳腐蚀破损漏液，不允许。 1、Corrosion of the surface of the cell due to chemical reaction of the aluminum shell broken leakage, not allowed.		NA	
气胀鼓包	1、电芯因内部化学反应而产生的气体无法排出导致的气胀，不允许。 1、Gas expansion caused by the inability of the cell to expel gas due to an internal chemical reaction is not allowed.		NA	

备注： 不同结构极柱参考同标准

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安全测试方法及测试标准

Safety testing methods and testing standards

测试项目	测试方法	测试标准
过充电 Over-charge	a) 电池单体完成初始化充电； b) 以 $I=P_{rc}/U_{nom}$ 恒流充电至电压达到电池单体充电截至电压的 1.5 倍或时间达到 1h 停止充电，观察 1h，记录电流、时间、电压、温度； c) 记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； a) The battery cells have completed the initial charging b) Charge at a constant current of I=Prc/Unom until the voltage reaches 1.5 times the charging cut-off voltage of each battery cell or the charging time reaches 1 hour, then stop charging. Observe for 1 hour and record the current, time, voltage and temperature. c) Record the test phenomena, including expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture;	不应起火、不应爆炸、不应在防爆阀或泄压点之外的位置发生破裂 No catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point.
过放电 Over-discharge	a) 电池单体完成初始化放电； b) 以 $I=P_{rd}/U_{nom}$ 恒流放电至电压达到 0V 或时间达到 1h 停止充电，观察 1h，记录电流、时间、电压、温度； c) 记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； a) The battery cells have completed the initial discharge; b) Discharge at a constant current of I=Prd/Unom until the voltage reaches 0V or the time reaches 1 hour, then stop charging. Observe for 1 hour and record the current, time, voltage and temperature. c) Record the test phenomena, including	不应漏液、不应冒烟、不应爆炸、不应在防爆阀或泄压点之外的位置发生破裂 No leak, smoke, explode or rupture at location other than explosion-proof valves or pressure relief point.

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	expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture;	
短路 External Short-circuit	a) 电池单体完成初始化充电； b) 调节短路试验装置电阻至[0.8,1.0]mΩ，短路 10min，观察 1h 注： a.试验装置电阻 0.8mΩ~1mΩ； b.正负极连接处接触电阻小于等于 0.1mΩ； c.外部线路电阻等于试验装置电阻和正负极连接处接触电阻之和。 a) The battery cells have completed the initial charging; b) Adjust the resistance of the short-circuit test device to [0.8,1.0]mΩ, short-circuit for 10 minutes, and observe for 1 hour notice: a. The resistance of the test device is 0.8mΩ to 1mΩ. b. The contact resistance at the connection between the positive and negative poles is less than or equal to 0.1mΩ. c. The resistance of the external circuit is equal to the sum of the resistance of the test device and the contact resistance at the connection points of the positive and negative poles.	不应起火、不应爆炸、不应在防爆阀或泄压点之外的位置发生破裂 No catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point.
跌落 Drop Test	a) 完成初始化充电的电池单体置于跌落试验装置的试验台； b) 将试验样品正极或者负极朝下从 1.5m 高度处自由跌落到水泥地面； c) 观察 1h； d) 记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； a) The battery cells that have completed the initial charging are placed on the test bench of the drop test device b) b) Drop the test sample freely from a height of 1.5 meters with the positive or negative electrode facing down onto the cement ground.	不应冒烟、不应起火、不应爆炸、不应在防爆阀或泄压点之外的位置发生破裂 No smoke, catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point.

	c) Observe for 1 hour; d) Record the test phenomena, including expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture;	
挤压 Crush Test	a) 电池单体完成初始化充电后，面积最大的外表面正对挤压头； b) 选取半径 R 为 75mm、长度 L 大于试验样品被挤压面尺寸的半圆柱体挤压头，将挤压速度的初始值设置为 5mm/s； c) 启动挤压试验装置，挤压力达到 50kN 时保持该挤压力 10min，停止挤压，观察 1h，记录电压、温度、挤压力； d) 记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； a) After the initial charging of the battery cell is completed, the largest outer surface is directly facing the extrusion head b) Select a semi-cylindrical extrusion head with a radius R of 75mm and a length L greater than the size of the extruded surface of the test sample, and set the initial value of the extrusion speed to 5mm/s; c) Start the extrusion test device. When the extrusion force reaches 50kN, maintain this extrusion force for 10 minutes, stop the extrusion, observe for 1 hour, and record the voltage, temperature and extrusion force d) Record the test phenomena, including expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture;	不应漏液、不应冒烟、不应起火、不应爆炸 No leak, smoke, catch fire, explode

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热失控 Thermal Runaway	a) 将完成了初始化充电的试验样品置于热失控试验装置中； b) 选取加热部件和温度传感器并布置于试验样品表面，设置温度采样周期为 1s，设定连续监测到三个温升速率值均≥3℃/s 或起火或爆炸为发生热失控的判定条件； c) 连接试验样品与充放电装置及其电压数据采样线； d) 以 $I=P_{rc}/U_{nom}$ 恒流充电，启动加热，记录时间、电压、电流、温度、温升速率，记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； e) 触发发生热失控的判定条件或温度达到 300℃或试验时间达到 4h 时，停止充电和加热，观察 1h，记录时间、电压、温度、温升速率，记录试验现象，包括膨胀、漏液、冒烟、起火、爆炸、外壳破裂及破裂位置； f) 断开试验样品和充放电装置的连接，拆除加热部件和数据采样线，取出试验样品； g) 记录发生热失控时的温度为热失控温度 a) Place the test samples that have completed the initial charging in the thermal runaway test device; b) Select the heating component and temperature sensor and arrange them on the surface of the test sample. Set the temperature sampling period to 1 second. Set the continuous monitoring of three temperature rise rate values all ≥3℃/s or fire or explosion as the determination condition for thermal runaway. c) Connect the test sample to the charge and discharge device and its voltage data sampling line; d) Charge at a constant current of I=Prc/Unom, start heating, record the time, voltage, current, temperature, and temperature rise rate, and record the test phenomena, including expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture; e) When the conditions for determining	热失控后不应起火、不应爆炸、不应在防爆阀或泄压点之外的位置发生破裂 No catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point after thermal runaway.

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	thermal runaway are triggered or the temperature reaches 300℃ or the test time reaches 4 hours, stop charging and heating, observe for 1 hour, record the time, voltage, temperature, and temperature rise rate, and record the test phenomena, including expansion, leakage, smoke, fire, explosion, shell rupture and the location of the rupture. f) Disconnect the test sample from the charge and discharge device, remove the heating component and data sampling line, and take out the test sample; g) The temperature at which thermal runaway occurs is recorded as the thermal runaway temperature	
高海拔初始化充放电 Initial charge-discharge performance at high altitude	a) 电池单体初始化充电； b) 将电池单体放入低气压箱中，将气压调节至11.6kPa，温度为(25±5) ℃，静置 6h c) 观察 1h d) 记录是否有膨胀、漏液、冒烟、起火、爆炸现象 a) Initial charging of individual battery cells; b) Place the battery cells into a low-pressure box, adjust the pressure to 11.6kPa and the temperature to (25±5) ℃, and let it stand for 6 hours c) Observe for 1 hour d) Record whether there is any expansion, leakage, smoking, fire or explosion	不应漏液、不应冒烟、不应爆炸、不应起火、不应在防爆阀或泄压点之外的位置发生破裂 No leak, smoke, catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point.
过载 Overload Test	a) 电池单体初始化放电； b) 以 4Prc 恒功率充电至电池单体的充电截至电压，静置 10min，记录功率、时间、电压、温度； c) 以 4Prd 恒功率放电至电池单体的放电截至电压，观察 1h，记录功率、时间、电压、温度； d) 记录是否有膨胀、漏液、冒烟、起火、爆炸、外壳破裂和破裂位置； a) Initial discharge of individual battery cells;	不应漏液、不应冒烟、不应爆炸、不应起火、不应在防爆阀或泄压点之外的位置发生破裂 No leak, smoke, catch fire, explode or rupture at location other than explosion-proof valves or pressure relief point.

	b) Charge the battery cell at a constant power of 4Prc to the charging cut-off voltage, let it stand for 10 minutes, and record the power, time, voltage and temperature; c) Discharge at a constant power of 4Prd to the discharge cut-off voltage of each battery cell, observe for 1 hour, and record the power, time, voltage and temperature. d) Record whether there is any expansion, leakage, smoking, fire, explosion, shell rupture and the location of the rupture;	

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