

Model 型号	C33-V2	Spec No. 规格书编号	PBRI-C33-V2-01-D06-01	Version NO. 版本	A
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SPECIFICATION OF PRODUCT

产品交付规格书

型号 (Model) : C33-V2

Designed 设计制作	Designer Checked 产品设计审核	QC Checked 品质审核	Sales Checked 销售审核	Approved 批准

Customer Signature 客户接收栏
公司名称 (Company name) :
批 准 (Approved by) :
日 期 (Signature Date) :

2024 年 5 月

EVE Power CO., LTD
湖北亿动力有限公司



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客户要求 (Customer Request)

NO. 序号	Special Requirements 特殊要求	Specification 标准
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2		
3		
4		
5		

客户代码 (Customer Code) : _____

签 字 (Signature) : _____

日 期 (Date) : _____

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术语定义 (Definition of Terms)

Terms 术语	Definition 定义
Product 产品	"Product" in this specification refers to 15 Ah rechargeable cylindrical lithium ion battery produced by EVE Power Co., Ltd. 本规格书中的“产品”是指湖北亿动力有限公司生产的 15Ah 可充电圆柱锂离子电池。
customer 客户	Refers to the buyer in the product sales contract of EVE Power Co., Ltd. 指《湖北亿纬动力产品销售合同》中的买方。
Environment Temperature 环境温度	The ambient temperature where the cell is located. 电芯所处的周围环境温度
Cell temperature 电池温度	The temperature measured by temperature sensor installed at the center of cell surface 由接入电池表面中心的温度传感器测试的电池温度
Rate 倍率 (C)	The ratio of the charge/discharge current to the rated capacity value. For example, the battery capacity is 15Ah, when the charging or discharging current is 15A, the charging or discharging rate is 1C. 充/放电电流与电池的额定容量值的比率。例如，电池容量为 15Ah，当充电或放电电流为 15A 时，则充电或放电倍率为 1C。
State of charge 荷电状态 (SOC)	Under no-load conditions, the ratio of the battery capacity state to the rated capacity measured in Ah or Wh. For example, if the capacity is 15Ah as 100% SOC, when the capacity is 0Ah, the SOC is 0%. 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容量状态与额定容量的比值。如：若将容量为 15Ah 的状态视为 100%SOC，则容量为 0Ah 时，SOC 为 0%。
Standard charging 标准充电	The charging mode described in Article 3.3 of this specification. 本规格书第 3.3 条所述的充电模式。
Standard discharging 标准放电	The discharging mode described in Article 3.4 of this specification. 本规格书第 3.4 条所述的放电模式。
AC resistance 交流内阻 (ACR)	Inject 1kHz sine wave current into the positive and negative poles of the cell, and the internal resistance obtained, which abbreviated as ACR. 给电池正负极注入 1kHz 的正弦波电流测试所得到的内阻值，缩写用 ACR 表示；
DC Resistance 直流电阻 (DCR)	The ratio of the voltage changes of the battery to the corresponding current change under working conditions. 工作条件下电池的电压变化与相应的电流变化之比。
Pulse Current 脉冲电流	The current or voltage pulses that appear periodically are called pulse currents. The pulse currents appear either in the same direction or in alternating positive and negative directions. 以周期重复出现的电流或者电压脉冲称为脉冲电流，脉冲电流或是以同一方向出现，或是以正负交替变换方向出现。

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测量单位 (Unit of measurement)

No. 序号	Unit 单位	Abbreviation 简写	Type of units 单位类型
1	毫伏特(Millivolt)	mV	电压单位 Voltage
2	毫安培(Mill ampere)	mA	电流单位 Current
3	安培-小时(Ampere-Hour)	Ah	容量单位 Capacity
4	瓦特-小时(Watt-Hour)	Wh	能量单位 Energy
5	毫欧姆(Milliohm)	mΩ	电阻单位 Resistance
6	摄氏度(Degree Celsius)	°C	温度单位 Temperature
7	毫米(Millimeter)	mm	长度单位 Length
8	秒(second)	s	时间单位 Time
9	分钟(Minute)	min	时间单位 Time
10	小时(Hour)	h	时间单位 Time
11	赫兹(Hertz)	Hz	频率单位 Frequency

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1. 基本信息 (Basic Information)

1.1. 适用范围 (Scope)

This product specification has been prepared to specify the cylindrical rechargeable lithium-ion cell to be supplied to customer by EVE Power Co., Ltd.

本产品规格书适用于由湖北亿动力有限公司生产的圆柱锂离子电池。

1.2. 产品类型 (Description)

Sealed Secondary Portable Li-Ion Cell.

密封二次便携式锂离子电池。

1.3. 产品型号 (Model Name)

EVE—C33-V2

① ② ③ ④

- ① The letter "EVE" defines EVE Power Co., Ltd.
"EVE"代表湖北亿动力有限公司。
- ② The letter "C" defines Cylindrical
"C"代表圆柱电池。
- ③ The letter "33" defines the diameter of the cell.
"33"代表电芯直径为 33 mm。
- ④ The letter "V2" defines the second-generation product.
"V2"代表第二代产品。

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2. 电池规格参数 (Specification Parameters)

2.1. 电池基本参数 (Basic Parameters)

Item 项目	Specification 标准		Remarks 备注
0.33C Capacity@3650-2500mV 0.33C容量@3650~2500mV	≥15000	mAh	0.33C discharge 0.33C放电
1C Capacity@3650~2500mV 1C 容量@3650~2500mV	≥14500	mAh	1C discharge 1C放电
AC-IR 交流内阻	≤2.5	mΩ	AC 1 kHz@25°C 30%SOC
DC-IR 直流内阻	≤8	mΩ	2C放电30s@25°C 30%SOC
End-of-charge Voltage 充电限制电压	3650	mV	
End-of-charge Current 充电截止电流	750	mA	0.05C
End-of-discharge Voltage 放电截止电压	T>0°C@2500 T≤0°C@2000	mV	
Nominal Voltage 额定电压	3200	mV	
Standard Charging current 标准充电电流	7500	mA	0.5C
Standard Discharge current 标准放电电流	15000	mA	1.0C
Pulse Charge current(<10s) 脉冲充电电流 (<10s)	30000	mA	2.0C
Pulse Discharge current(<10s) 脉冲放电电流 (<10s)	45000	mA	3.0C

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Operating Temperature Range 操作温度范围	Charging Temp. 充电温度	0~10°C	≤3000mA			
		10-45°C	≤7500mA			
		45-50°C	≤6000mA			
		50-55°C	≤3000mA			
	Discharging Temp. 放电温度	-20~60°C				
	Storage Humidity 存储湿度	≤70% RH				
Monthly self-discharge rate 月自放电率	≤3.0	%/month	25°C, shipment state, new cell storage after 3 months 25°C 出货态, 新电池存储3个月后			

2.2. 产品规格 (Product Specification)

2.2.1. 尺寸、重量指标 (Dimension and Weight)

NO. 序号	Item 项目	Specification 标准	Test Method Chapter 测试方法章节
1	Cell Dimension 电芯尺寸	Diameter: $\Phi 33.3 \pm 0.2$ mm (coated) 直径: $\Phi 33.3 \pm 0.2$ mm (包膜)	3.5.1.
		Height : 140.8 ± 0.5 mm (pole contained) 总高: 140.8 ± 0.5 mm (含极柱)	3.5.1
		Shoulder Height : 136.36 ± 0.25 mm (pole not contained) 肩高: 136.36 ± 0.25 mm (不含极柱)	3.5.1.
2	Cell Weight 重量	263.9 ± 6 g	3.5.2.

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2.2.2. 电性能指标 (Electrical Performance)

NO. 序号	Test Item 测试项目	Specification 标准	Test Method Chapter 测试方法章节	
1	Capacity 容量	0.33C discharge 0.33C 放电	≥15000mAh	3.5.4.1
2		1C discharge 1C 放电	≥14500mAh	3.5.4.1
3	Temperature Dependence of Discharge Capacity (1.0C discharge) 不同温度放电性能 (1.0C 放电)	-20°C Retention Ratio -20°C容量保持率	≥70%	3.5.4.2.
4		-10°C Retention Ratio -10°C容量保持率	≥80%	3.5.4.2.
5		0°C Retention Ratio 0°C容量保持率	≥85%	3.5.4.2.
6		25°C Retention Ratio 25°C容量保持率	100%	3.5.4.2.
7		45°C Retention Ratio 45°C容量保持率	≥95%	3.5.4.2.
8		60°C Retention Ratio 60°C容量保持率	≥95%	3.5.4.2.
9	100% SOC Temperature Charge Retention and Regain 100% SOC 荷电保 持及容量恢复	28d, 25°C 100%SOC	Retention Ratio≥97% Self-discharge Ratio≤3% 容量保持率≥97% 自放电率≤3%	3.5.4.3.
10		28d, 45°C 100%SOC	Recovery Ratio≥95% 容量恢复率≥95%	3.5.4.3.
11		7d, 55°C 100%SOC	Retention Ratio≥95% Recovery Ratio≥96% 容量保持率≥95% 容量恢复率≥96%	3.5.4.3.
12	Life 寿命	25°C Cycle Life 25°C 循环寿命	After 2000 cycles, Capacity retention≥80% Initial capacity 2000 周后容量保持率≥80%	3.5.4.4.
13		45°C Cycle Life 45°C 循环寿命	After 1000 cycles, Capacity retention≥70% Initial capacity 1000 周后容量保持率≥70%	3.5.4.5.

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2.2.3. 安全性能指标 (Safety Performance)

The cell can meet the requirements of GB38031-2020 and the following items:

电芯可满足 GB38031-2020 以下项目：

NO. 序号	Test Item 测试项目	Specification 标准	Citing Standard 引用标准	Test Method Chapter 测试方法章节
1	Over-charge Test 过充电测试	No explosion, no fire 不爆炸、不起火	IEC62660-2-2010	3.5.5.1.
2	Drop Test 跌落测试	No explosion, no fire 不爆炸、不起火	GB/T 36276-2018	3.5.5.2.
3	Seawater immersion 海水浸泡测试	No explosion, no fire 不爆炸、不起火	GB/T 31485-2015	3.5.5.3.
4	Low Pressure Test 低气压测试	No explosion, no fire, no leakage 不爆炸、不起火、不漏液	UN38.3	3.5.5.4.
5	Vibration Test 振动测试	No explosion, no fire, no leakage 不爆炸、不起火、不漏液	UN38.3	3.5.5.5.
6	Temperature Shock Test 温度冲击测试	No explosion, no fire, no leakage 不爆炸、不起火、不漏液	UN38.3	3.5.5.6.

2.3. 电池图纸 (Outline Dimensions)

See the attachment (Fig. A).

见附录图一。

2.4. 外观 (Appearance)

There shall be no such defects as rust, discoloration, leakage which may adversely affect commercial value of the cell.

电池应无明显擦伤、裂痕、锈渍、变色或电解液泄漏这类对电池商用价值有影响的缺陷。

3. 试验条件 (Standard Test Condition)

3.1. 环境条件 (Environment Condition)

Unless otherwise specified, all tests stated in this Product Specification should be conducted at temperature $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and humidity $65\%\pm 20\%$ RH.

若无特别要求，此规格书上的产品测试条件均为温度： $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ ；湿度： $65\%\pm 20\%$ RH。

3.2. 测量设备 (Measuring Equipment)

The accuracy of measuring instruments and meters should meet the following requirements:

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测量仪器、仪表准确度应满足以下要求：

- (1) 电压测量装置 (Volt measuring Equipment) : $\pm 0.1\%$;
- (2) 电流测量装置 (Amp measuring Equipment) : $\pm 0.1\%$;
- (3) 温度测量装置 (Temp measuring Equipment) : $\pm 0.5^{\circ}\text{C}$;
- (4) 尺寸测量装置 (Dimension measuring Equipment) : $\pm 0.01\text{mm}$;
- (5) 重量测量装置 (Weight measuring Equipment) : $\pm 0.1\text{g}$.

3.3. 标准充电方式 (Standard Charge Method)

The "Standard Charge" means charging the cell at a constant current of 0.5C until the voltage is 3650mV, then charge at a constant voltage of 3650mV until its current is less than 0.05C. For test purpose, charging shall be performed at $25\pm 2^{\circ}\text{C}$. Unless otherwise specified, it indicates "Standard Charge".

“标准充电”即在环境温度为 $25\pm 2^{\circ}\text{C}$ 的条件下，先以恒定电流 0.5C 充电至 3650mV，再以 3650mV 的恒压充电至电流小于 0.05C。若无特别说明，此规格书充电方式表示“标准充电”。

3.4. 标准放电方式 (Standard Discharge Method)

The "Standard Discharge" means discharging the cell at a constant current of 1.0C until the voltage is 2500mV. For test purpose, discharging shall be performed at $25\pm 2^{\circ}\text{C}$. Unless otherwise specified, it indicates "Standard Discharge".

“标准放电”即在环境温度为 $25\pm 2^{\circ}\text{C}$ 的条件下，以恒定电流 1.0C 放电到 2500mV。若无特别说明，此规格书放电方式表示“标准放电”。

3.5. 测试方法 (Test Method)

3.5.1. 尺寸 (Dimension)

Use a caliper to measure the diameter, and height gauge to measure height of the cell.

使用卡尺测量电芯直径，高度规测试电芯高度。

3.5.2. 重量 (Weight)

Use an electronic scale to measure the weight of the battery.

使用电子秤测量电池的重量。

3.5.3. 内阻 (Internal Resistance)

ACR: At $25\pm 2^{\circ}\text{C}$, when the SOC is 30 % at ambient temperature, test the cell with a frequency of AC 1kHz.

DCR: At $25\pm 2^{\circ}\text{C}$, the cell is discharged to 2000mV with a current of 0.5C, rest for 3 min, and discharged at to 2000mV with a current of 0.1C. Rest for 2 min. charge with constant current of 0.5C for 42min. Then rest for 30 min, and record the voltage V_1 at the end of the period. Put a 30 s discharge pulse current of 2 C and record the voltage V_2 at the end of the pulse, and calculate the $\text{DCR} = (V_1 - V_2) \times 1000 / 30$ (m Ω).

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ACR: 在环境温度 $25\pm 2^{\circ}\text{C}$ 的条件下, 30%SOC 的电芯采用 1kHz 的频率进行测试。

DCR: 在环境温度 $25\pm 2^{\circ}\text{C}$ 的条件下, 电芯以 0.5C 放电至 2000mV, 搁置 3min, 以 0.1C 进行放电, 截止电压为 2.0V, 搁置 2min, 使用 0.5C 的电流充电 42min, 搁置 120min, 记录搁置末期电压 V_1 , 用 2C 的电流放电 30s, 记录放电末端电压 V_2 , 计算 $\text{DCR} = (V_1 - V_2) \times 1000 / 30 \text{ (m}\Omega\text{)}$ 。

3.5.4. 电性能 (Electrical Characteristics)

3.5.4.1. 放电容量 (Discharge Capacity)

0.33C discharge capacity: Fully charge in standard charging form at $25\pm 2^{\circ}\text{C}$, rest for 30 minutes, and then discharge at 0.33C to 2500mV. Cycle 5 times and record the maximum discharge capacity.

1C discharge capacity: Fully charge in standard charging form at $25\pm 2^{\circ}\text{C}$, rest for 30 minutes, and then discharge at 1C to 2500mV. Cycle 5 times and record the average discharge capacity for the last three times.

0.33C 放电容量: 在环境温度 $25\pm 2^{\circ}\text{C}$, 0.5 C 恒流恒压充电至 3650mV, 0.05 C 截止, 搁置 30 min; 0.33C 恒流放电至 2500mV 截止, 搁置 30 min; 循环 5 次, 记录放电容量最大值。

1C 放电容量: 在环境温度 $25\pm 2^{\circ}\text{C}$, 0.5 C 恒流恒压充电至 3650mV, 0.05 C 截止, 搁置 30 min; 1 C 恒流放电至 2500mV 截止, 搁置 30 min; 循环 5 次, 记录后三次放电容量均值。

3.5.4.2. 不同温度放电性能 (Temperature Dependence of Discharge Capacity)

Capacity calibration: At $25\pm 2^{\circ}\text{C}$, the cell is charged to 3650mV with constant current of 0.5 C, then charge at constant voltage of 3650mV until decreases to 0.05 C, and rest for 30 minutes; Discharge at a constant current of 1 C to a cutoff of 2500mV and record the discharge capacity. Then, the cell is fully charged according to the standard charging method at $25\pm 2^{\circ}\text{C}$.

Low temperature discharge: Rest at $-10/0\pm 2^{\circ}\text{C}$ for 12 hours, and then discharge at 1C to 2000mV at $-10/0\pm 2^{\circ}\text{C}$. Record the discharge capacity, and the capacity retention = the specific temperature discharge capacity/calibration capacity.

-20°C discharge: Rest at $-20\pm 2^{\circ}\text{C}$ for 24 hours, and then discharge at 1C to 1500mV at $-20\pm 2^{\circ}\text{C}$. Record the discharge capacity at 2000mV, and the capacity retention = the specific temperature discharge capacity/calibration capacity.

High temperature discharge: Rest at $45/60\pm 2^{\circ}\text{C}$ for 6 hours, then discharge at 1C at $45/60\pm 2^{\circ}\text{C}$ to 2500mV, record the discharge capacity, and the capacity retention = the specific temperature discharge capacity/calibration capacity.

容量标定: 在环境温度 $25\pm 2^{\circ}\text{C}$ 下对电池进行 1C 放电至 2500mV 进行容量标定, 记录标定容量。然后在 $25^{\circ}\text{C} \pm 2$ 使用标准充电方式对电芯充满电。

低温放电: 在 $-10/0\pm 2^{\circ}\text{C}$ 下搁置 12h, 再在此温度下 1C 放电至 2000mV, 记录放电容量, 容量保持率 = 放电容量 / 标定容量。

-20°C 放电: 在 $-20\pm 2^{\circ}\text{C}$ 下搁置 24h, 再在此温度下 1C 放电至 1500mV, 记录 2000mV 放电容量, 容量保持率 = 放电容量 / 标定容量。

高温放电: 在 $45/60\pm 2^{\circ}\text{C}$ 下搁置 6h, 再在此温度下 1C 放电至 2500mV, 记录放电容量, 容量保持率 = 放电容量 / 标定容量。

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量/标定容量。

3.5.4.3. 100% SOC 荷电保持及容量恢复 (100% SOC Temperature Charge Retention and Regain)

Capacity calibration is carried out according to standard charging and discharging method, recording the discharge capacity C_0 ; Then, the cell is fully charged according to the standard charging method. After that, rest the cell at $25\pm 2^\circ\text{C}$ / $45\pm 2^\circ\text{C}$ for 28D/7D, and discharge it to 2500mV with constant current of 0.5 C under the environment of $25\pm 2^\circ\text{C}$. The discharge capacity is recorded as discharge retention capacity. Then, cycling three times according to the standard charging and discharging method (record the third time as the discharge recovery capacity). Capacity retention rate = discharge retention capacity / calibration capacity $\times 100\%$, capacity recovery rate = discharge recovery capacity / calibration capacity $\times 100\%$.

电池先按照标准充放电方式进行标定容量测试，而后电池按照标准充放电制度充满电，在环境温度 $25\pm 2^\circ\text{C}$ / $45\pm 2^\circ\text{C}$ / $55\pm 2^\circ\text{C}$ 的条件下搁置 28 天/7 天，然后在环境温度 $25\pm 2^\circ\text{C}$ 的条件下按照标准放电制度放电至 2500mV (记录放电保持容量)，搁置 30 min，然后按照标准充放电制度循环三次 (记录第三次为放电恢复容量)。容量保持率 = 放电保持容量 / 标定容量 $\times 100\%$ ，容量恢复率 = 放电恢复容量 / 标定容量 $\times 100\%$ 。

3.5.4.4. 25°C 循环寿命 (25°C Cycle Life)

At ambient temperature of $25 \pm 2^\circ\text{C}$, Charge the cell to 3500mV with constant current of 0.5 C, then switching to constant voltage charging to 0.05 C to cut off, and rest for 30 min. Discharge to 2750mV with constant current of 0.5 C and rest for 30 min. Repeat charge and discharge and cycle 2000times.

在环境温度 $25^\circ\text{C} \pm 2^\circ\text{C}$ 的条件下，以 0.5 C 恒流充电至 3500mV，再恒压充电至电流 0.05 C 截止；搁置 30 min，然后以 0.5 C 放电至 2750mV，放电结束后搁置 30 min 后进行下一个循环，直至循环 2000 次。

3.5.4.5. 45°C 循环寿命 (45°C Cycle Life)

At ambient temperature of $45 \pm 2^\circ\text{C}$, Charge the cell to 3500mV with constant current of 0.5 C, then switching to constant voltage charging to 0.05 C to cut off, and rest for 30 min. Discharge to 2750mV with constant current of 0.5 C and rest for 30 min. Repeat charge and discharge and cycle 1000times.

在环境温度 $45^\circ\text{C} \pm 2^\circ\text{C}$ 的条件下，以 0.5 C 恒流充电至 3500mV，再恒压充电至电流 0.05 C 截止；搁置 30 min，然后以 0.5C 放电至 2750mV，放电结束后搁置 30 min 后进行下一个循环，直至循环 1000 次。

3.5.5. 安全性能 (Safety Test)

All below tests are carried out on the equipment with forced ventilation and explosion-proof device. Before test, all cells should be charged in accordance with 3.3.

下述试验应在有强制排风条件及防爆措施的装置内进行，在试验前所有的电芯都按 3.3 规定标准充电方式充电后再进行以下试验。

3.5.5.1. 过充电测试 (Over-charge Test)

At ambient temperature of $25^\circ\text{C} \pm 2^\circ\text{C}$, the cell is charged to 2.0 times cut-off voltage. After completing above

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steps, observe for 1h at ambient temperature.

测试环境温度 $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ，以 1 C 电流恒流充电至电池电压达到 2.0 倍充电终止电压。完成以上试验步骤后，在试验环境温度下观察 1 h。

3.5.5.2. 跌落测试 (Drop Test)

At ambient temperature of $25 \pm 2^{\circ}\text{C}$, drop the cathode and anode terminal of the cell down freely from the height of 1.5m to the cement ground once. After completing above steps, observe for 1h at ambient temperature.

测试环境温度 $25 \pm 2^{\circ}\text{C}$ ，将电芯的正极或者负极端子朝下从 1.5m 高度处自由跌落到水泥地面上 1 次。完成以上试验步骤后，在试验环境温度下观察 1 h。

3.5.5.3. 海水浸泡测试 (Seawater immersion Test)

At ambient temperature of $25 \pm 2^{\circ}\text{C}$, completely immerse the battery cell in a 3.5% NaCl solution (mass fraction, simulated seawater composition at room temperature) for 2h.

测试环境温度 $25 \pm 2^{\circ}\text{C}$ ，将电芯浸入 3.5%NaCl 溶液（质量分数，模拟常温下海水成分）中 2h。

3.5.5.4. 低气压 (Low Pressure Test)

At ambient temperature of $25 \pm 2^{\circ}\text{C}$, the cell is placed in a low-pressure(11.6kPa) box for 6h. After completing above steps, observe for 1h at ambient temperature.

测试环境温度 $25 \pm 2^{\circ}\text{C}$ ，将电池放入 11.6kPa 的真空箱中搁置 6h，完成以上试验步骤后，在试验环境温度下观察 1 h。

3.5.5.5. 振动测试 (Vibration Test)

At ambient temperature of $25 \pm 2^{\circ}\text{C}$, the cell is fixed on the following vibration fixture for vibration. Starting from 7Hz, maintain a maximum acceleration of 1gn until the frequency reaches 18Hz, then maintain the amplitude at 0.8mm (total deviation of 1.6mm) and increase the frequency until the maximum acceleration is 8gn (frequency is about 50Hz). The next step is to maintain the acceleration at 8gn until the frequency increases to 200Hz; x, y, z axis for 3h each, totaling 9h. After completing above steps, observe for 1h at ambient temperature.

测试环境温度 $25 \pm 2^{\circ}\text{C}$ ，电芯固定在以下振动工装上进行振动，从 7Hz 开始，保持 1gn 的最大加速度，直至频率达到 18Hz，然后将振幅保持在 0.8mm（总偏移 1.6mm），并增加频率直至最大加速度 8gn（频率约为 50Hz），然后将加速度保持在 8gn，直至频率增加至 200HZ；x, y, z 方向各 3h，共计 9h。完成以上试验步骤后，在试验环境温度下观察 1 h。

(Refer to UN38.3 参考 UN38.3)

3.5.5.6. 温度冲击测试 (Temperature Shock Test)

At ambient temperature of $25 \pm 2^{\circ}\text{C}$, conduct high and low temperature impact tests at $72 \pm 2^{\circ}\text{C}$ and $-40 \pm 2^{\circ}\text{C}$, store at extreme temperature for 6 hours, with a high and low temperature limit transition time ($\leq 30\text{min}$). After conducting 10 cycles, store at room temperature ($20 \pm 5^{\circ}\text{C}$) for 24h.

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测试环境温度 $25 \pm 2^\circ\text{C}$ ，在 $72 \pm 2^\circ\text{C}$ 和 $-40 \pm 2^\circ\text{C}$ 下进行高低温冲击试验，在极限温度中存放 6h，高低温极限转换时间 $\leq 30\text{min}$ ，温度循环 10 次，然后在室温 $20 \pm 5^\circ\text{C}$ 下存放 24h。

(Refer to UN38.3 参考 UN38.3)

4. 电池操作说明及注意事项 (Cell Operation Instruction and Precautions)

4.1. 储存建议 (Storage Recommendations)

4.1.1. 短期存放 (Short Period Storage)

- * Storage the cell at temperature of $0^\circ\text{C} \sim 45^\circ\text{C}$ (less than 3 months) , low humidity and no corrosive gas atmosphere.

电芯短期存放（不超过 3 个月）应储存在 $0^\circ\text{C} \sim 45^\circ\text{C}$ 温度范围，低湿度和不含腐蚀性气体的环境中。

- * No press on the cell
不要让电芯承受任何压力。

4.1.2. 长期存放 (Long Period Storage)

- * After charging, the cell should be used as soon as possible to avoid loss of usable capacity due to self-discharge. If long-term storage is required, adjust the cell SOC to 15%~40%. The recommended storage conditions are: $0^\circ\text{C} \sim 35^\circ\text{C}$, relative humidity $\leq 60\%$.

电芯进行充电后，需尽快使用，以免因自放电而造成可用容量巡视，若需要存储，应将 SOC 调整为 15-40%SOC。推荐的存储条件为： $0 \sim 35^\circ\text{C}$ ，相对湿度 $\leq 60\%$ 。

- * The state of charge (SOC, capacity state) of the cell should be kept at 15% ~ 40% during storage. In order to prevent the performance differences after long-term storage (more than three months), perform a standard charge-discharge cycle every 3 months. It is recommended that the storage time after receiving the cells should not exceed half a year to avoid quality problems due to storage overdue.

电池存储时，SOC 应该保持在 15-40%，长期存储（三个月以上）时为防止电池性能差异，应每 3 个月进行一次标准充放电循环，建议收到货后储存时间不超过半年，避免存储超期造成的质量问题。

4.2. 运输及装卸要求 (Transportation and Handling Requirements)

- * It is not allowed to ship with inflammable, explosive and corrosive articles in the same vehicle during transportation, and stacking is prohibited during large package transportation; The product shall not be exposed to rain, snow and other liquid substances without any protection, or suffer mechanical damage;

在运输过程中不允许和易燃，易爆，易腐蚀的物品同车装运，大包装运输过程中禁止堆叠；产品不允许经受雨，雪或液体物质的淋袭和机械伤害。

- * While handling, lift trucks or special tools shall be used to load and unload products; Handle with care, do not throw or squeeze, which may cause cell damage or personal injury. It is strictly prohibited to put cells together with corrosive substances such as acid and alkali.

产品装卸时，需采用升降车或者专用工具对产品进行上下车；需要轻取轻放，不得扔掷，挤压，造成电池损

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坏或对人身意外伤害，严禁与酸碱等腐蚀产品放在一起。

4.3.操作说明 (Operation Instruction)

4.3.1. 充电 (Charging)

- * Charge the cell in an ambient temperature range of 0°C to 55°C.

电芯充电环境温度范围为 0°C~55°C。

- * Charge the cell at a constant current of 7500mA until 3650mV is attained.

- * 建议以 7500mA 的电流恒流充电至 3650mV。

4.3.2. 放电 (Discharging)

- * Recommended cut-off voltage to 2500mV for temperature above 0°C and 2000mV for temperature below 0°C.

Discharge rates greater than 45000mA are not recommended.

建议温度在 0°C 以上的放电终止电压为 2500mV，0°C 以下的放电终止电压为 2000mV，超过 45000mA 的电流建议不要使用。

- * For maximum performance, discharge the cell in an ambient temperature range of -20°C to 60°C.

为了达到较好的性能，电芯的放电环境温度范围为 -20°C~60°C。

Remarks 备注：

a) Avoid charging the cell at low temperatures (including but not limited to standard charge, quick charge, emergency charge and regenerative charge) prohibited by this specification, otherwise unexpected capacity reduction may occur. The battery management system should be controlled according to minimum charging and regenerative charging temperatures. Charging at temperatures lower than specified in this specification is prohibited, otherwise, EVE will not bear all relevant responsibilities such as quality assurance liability and loss compensation caused thereby.

a) 电池避免在本技术协议禁止的低温条件下充电（包括但不限于充电，快充，紧急情况充电和再生充电等），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。禁止在低于本技术协议规定的温度条件下充电，否则，乙方不承担质量保证责任及由此引起的损失赔偿等一切相关责任。

b) The heat dissipation of battery should be fully considered in the design of cell pack; EVE is not responsible for the quality assurance caused by overheating due to the heat dissipation design of cell pack.

b) 电池包设计中应充分考虑电芯的散热问题，由于电池包散热设计问题导致的电芯或电池过热损坏，乙方不承担质量保证责任。

4.3.3. 产品寿命终止管理 (Product End-life Management)

The cell life is limited. Customers should establish an effective tracking system to monitor and record the internal resistance and capacity of each cell during its life. The measurement method and calculation method of internal resistance and capacity need to be discussed and agreed between the customer and EVE. When the internal resistance of the cell in use exceeds 150% of the initial internal resistance of the cell, or the capacity is less than 70% of the nominal

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capacity, the cell should not to be operated. Violation of this requirement will exempt EVE from its responsibility for product quality assurance in accordance with the product sales agreement and this specification, as well as all related liabilities such as loss compensation caused thereby.

电池的使用期限是有限的，客户应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和容量。内阻及容量的测量方法和计算方法需要客户和 EVE 共同讨论和双方同意。当使用中电池内阻超过这个电池最初内阻的 150%或容量小于标称容量的 70%，应立即停止使用电池。违反该项要求，将免除 EVE 依据产品销售协议以及本规格书所应承担产品质量保证责任及由此引发的损失赔偿等一切相关责任。

4.3.4. 电芯防范措施 (Standard Cell Precaution)

* It is strictly forbidden to immerse the cell in water. When it is not in use, it should be placed in a cool and dry environment.

严禁将电池浸入水中，保存不用时，应放置于阴凉干燥的环境中。

* Do not over-charge the cell. During cell installation and use, hardware and software must be protected against multiple over-charge failures.

禁止电池过充，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。

* If improper charge termination occurs, the root reasons shall be found and resolved before reuse to avoid negative effects on electrical and safety performances.

电池非正常终止充电时，为避免未知原因对电池性能及安全的影响，需明确根本原因并彻底解决后再使用。

* It is forbidden to over-discharge. During the normal use of the cell, charge the cell regularly to keep the voltage above 2.8 V, so as to avoid over-discharge

禁止过放电。在电池正常使用过程中，为防止过放电，电池应定期充电，将电压维持在2.8V以上。

* It is forbidden to use metal to directly connect the positive and the negative of the cell to short-circuit.

禁止用金属直接连接电池正负极短路。

* During use, please connect the positive and the negative of the cell strictly according to the labels and instructions, and reverse charging is forbidden.

在使用中，严格按照标识和说明连接电池正负极，禁止反向充电。

* It is forbidden to transport or store the cell with metallic, such as knife, coin, necklaces, etc.

禁止将电池与金属制品，如刀，硬币和项链等等。

* It is forbidden to use or place the cell at high temperature or flame environment. Otherwise, cell overheat, function failure or life shorten may occur.

禁止在高温或者火星中使用或放置电池，或者会引发电池过热或功能失效，寿命缩短。

* Do not subject the cell to mechanical shocks, collision and pressure impact.

不要使电芯承受机械冲击，碰撞及压力冲击。

* It is forbidden to knock, throw, step on or bend the cell and directly pierce the battery with nails or other sharp objects. Do not use the cell with conspicuous damage or deformation.

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严禁敲击、抛掷、踩踏、弯折电池，严禁用钉子或其他利器刺穿电池。不要使电芯受到明显的损害或变形。

- * Please use a special charger for lithium-ion batteries when charging.

充电时请采用锂离子专用充电器。

- * It is forbidden to directly weld the cell.

严禁直接焊接电池。

- * It is forbidden to use it in places with strong static electricity and strong magnetic fields;

严禁在强静电和强磁场的地方使用。

- * If the cell leaks and the electrolyte spills onto the skin or clothes, immediately wash the affected area with running water. If the cell leaks and the electrolyte enter the eyes, mouth, nose and other open parts of the human body, immediately wash with plenty of water and seek medical treatment immediately, otherwise serious injuries will be caused to the human body. No person or animal is allowed to swallow any part of the cell or any substance contained in the cell. No person or animal is allowed to swallow any part of the cell or any substance contained in the cell.

如果电池漏液，电解液溅到皮肤或者衣服上，应立即用流动的水清洗受影响区域，如果电池发生泄露，电解液浸入眼睛、口、鼻等人体开发部位，应立即用大量清水冲洗，并马上送医治疗，否则会对人体造成严重伤害。禁止任何人或动物吞食电池的任何部位或者电池所含物质。

- * If the cell emits peculiar smell, heat, discoloration, deformation, or any abnormality during use, storage, or charging, immediately remove the cell from the device or charger and stop using it.

如果电池发出异味、发热、变色、变形或者电池在使用，存储，充电过程中出现任何异常，应立即将电池从装置或者充电器中移离并停用。

- * It is forbidden to mix different types of cells in the same battery system.

严禁不同型号电池混用。

- * It is prohibited to disassemble the product without the written consent of EVE.

未经 EVE 书面同意，禁止私自拆解电池。

- * The blue sleeve and the black insulating mat of cell, that encapsulate the cell both provide insulation protection. For safety, the cell must be used with the sleeve and the insulating mat. EVE does not assume any after-sales service or warranty responsibility for problems caused by using the cell without the sleeve or the insulating mat.

电芯的蓝色套标与黑色绝缘面垫均起绝缘保护作用。为确保安全，电芯需要带套标与绝缘面垫使用。在无套标、无绝缘面垫状态下使用电芯导致的问题，EVE 不承担售后与质保责任。

4.4.其他 (Others)

For the sake of safety assurance, if there are equipment design, lithium ion cell system protection circuit, fast charging and other special application, please consult EVE first. Any matters not mentioned in this specification must be negotiated and determined by both parties.

为了安全起见，如有设备设计，锂离子电池系统保护电路或大电流，快速充电和其它方面的特殊应用，请先咨询亿纬公司相关事宜。任何本规格书中未提及的事项，须经过双方协商确定。

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This specification is written in both Chinese and English. In case of any conflict between the English version and the Chinese version, the Chinese version shall prevail.

本规格书由中英两种语言书写，当英文版本和中文版本发生冲突时，以中文版本为主。

5. 免责声明 (Disclaimer)

If the product demand unit or user does not use the product in accordance with the provisions of this manual, EVE will no longer bear all relevant responsibilities such as product quality assurance liability and loss compensation caused thereby. In case of any negative impact on EVE's reputation due to the above-mentioned acts, EVE reserves the right to investigate the legal liability of the product demand unit.

如果由于产品需求单位和使用者的不按本说明书中的规定进行使用，EVE 不再承担产品质量保证责任及由此引发的损失赔偿等一切相关责任。因前述行为，对 EVE 的声誉造成负面影响的，EVE 将保留追究产品需求单位法律责任权利。

6. 联系方式 (Consultation)

As to the obscurity, contact the following:

Address: No.68 Jingnan Avenue, Duodao District, High-tech Zone, Jingmen, Hubei Province, China

Email: sales@evebattery.com

Website: <http://www.evepower.com>

如有疑问，请按以下方式咨询：

地址：中国·湖北省荆门市高新区·掇刀区荆南大道 68 号，湖北亿纬动力有限公司

联系邮箱：sales@evebattery.com

网 址：<http://www.evepower.com>

附图一：C33-V2 图纸 (Attachment I: C33-V2 Drawing)

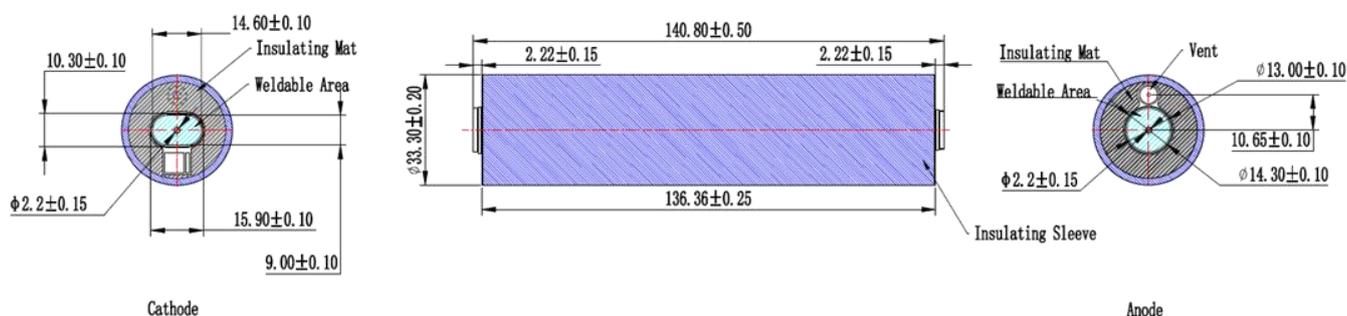


图 A (Figure A)

附图二：C33-V2 空运包装 (Attachment II: C33-V2 Air Transport Packing)

Each box contains 60 PCS cell, as shown in figure B.

每箱 60pcs 电芯，如图 B 所示。

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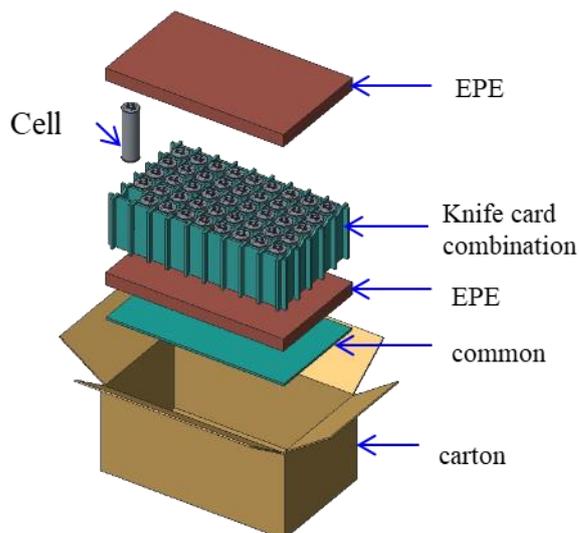


Figure B (图 B)

Each card board has 40 boxes, divided into 5 layers, as shown in figure C.

每卡板 40 个箱子，分 5 层，如图 C 所示。

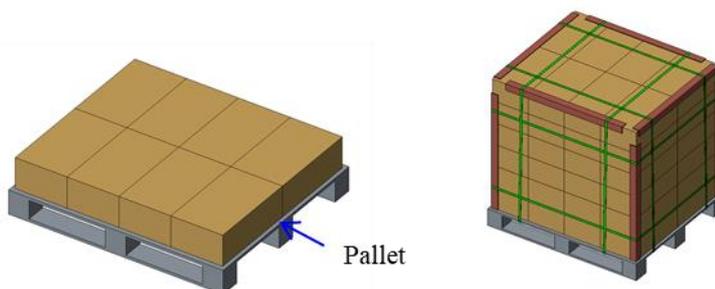


Figure C (图 C) (Unit:mm)

附图三：C33-V2 海运和陆运包装 (Attachment II: C33-V2 Sea and AirTransport Packing)

Each EPP box contains 138 pcs cell, as shown in figure D.

每层 EPP 箱共 138pcs 电芯，如图 D 所示。

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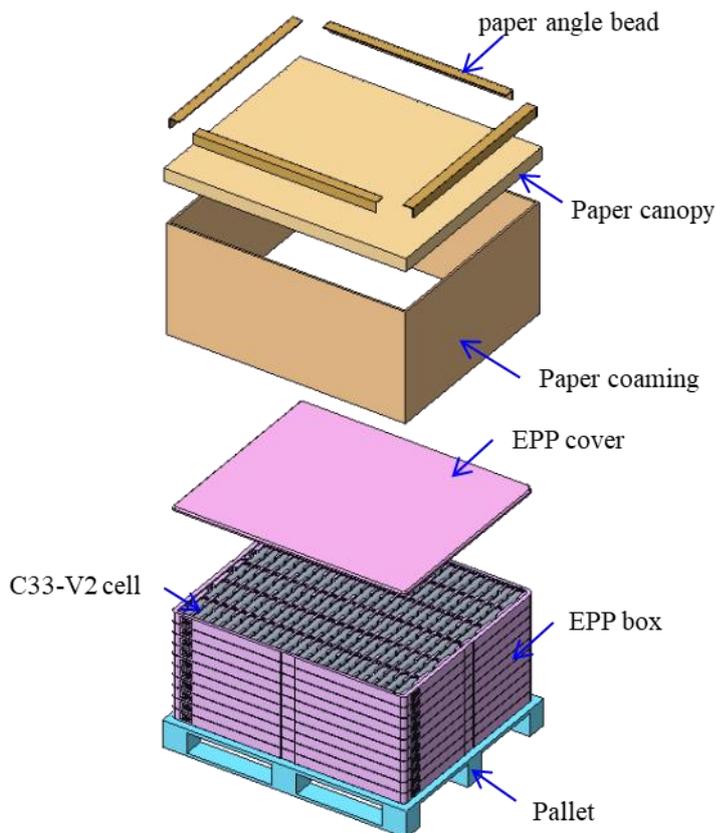


Figure D (图 D) (Unit:mm)

Single pallet stacking with 9 layers of EPP boxes, using three-layer pallet stacking for sea transportation, as shown in Figure E.

海运单卡板堆叠9层 EPP 箱，采用三层卡板堆叠运输，如图 E 所示。

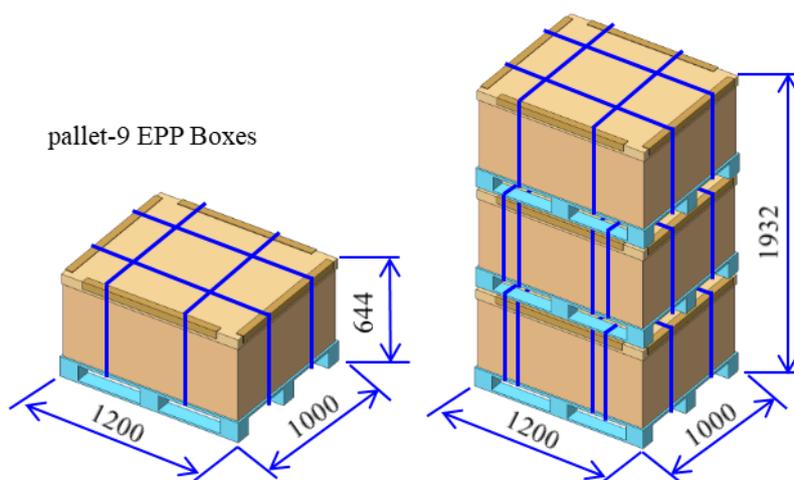


Figure E (图 E) (Unit:mm)

Model 型号	C33-V2	Spec. NO 规格书编号	PBRI-C33-V2-01-D06-01	Version NO. 版本	A
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Land transportation adopts stacking 18 layers of EPP boxes, as shown in figure F.

陆运堆放 18 层 EPP 箱，如图 F 所示。

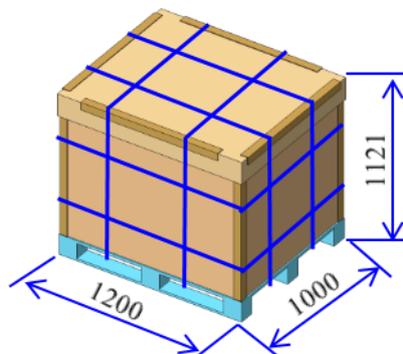


Figure F (图 F) (Unit:mm)