



CM Batteries Co., LTD

# 电芯规格书

## Cell Specification

产品名称: Product Name	14500 圆柱型锂离子二次电池 14500 cylindrical lithium-ion rechargeable battery
产品型号: Product Model	14500R
客户 Customer	
文件编号: Document No.	TBD
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CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	1 / 11

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	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	2 / 11

## 目录 Table of Content

<b>1. 适用范围 Scope</b> .....	<b>4</b>
<b>2. 产品内容 Product content</b> .....	<b>4</b>
2.1 品名 Product name.....	4
2.2 产品型号 Model of product.....	4
<b>3. 产品规格 Product specifications</b> .....	<b>4</b>
3.1 标准容量 Rated capacity.....	4
3.2 标准电压 Nominal voltage.....	4
3.3 放电截止电压 Discharge Cut-off Voltage.....	4
3.4 放电终止电压 Final discharging voltage.....	4
3.5 充电限制电压 limited charge voltage.....	4
3.6 充电上限电压 Upper charge voltage.....	4
3.7 最大连续充电电流 Maximum continuous charge current.....	4
3.8 最大连续放电电流 Maximum continuous discharge current.....	5
3.9 重量 Mass.....	5
3.10 使用温度范围 Operating temp. range.....	5
3.11 保存温度 Storing temperature range.....	5
<b>4. 性能及测试 Performance and test conditions</b> .....	<b>6</b>
4.1 外观 Outside appearance.....	6
4.2 外部尺寸 Outside dimensions.....	6
4.3 不同温度放电时间 Discharge time at different temperatures.....	6
4.4 出货内阻 Internal resistance at delivery.....	6
4.5 开路电压 Open circuit voltage.....	6
4.6 出货时开路电压 Open circuit voltage at delivery Cycle life.....	6
4.7 循环寿命 Cycle life.....	6

	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	3 / 11

4.8 保存特性 Storage characteristics.....	7
<b>5. 安全性 Safety.....</b>	<b>8</b>
5.1 外部短路 External short circuit.....	8
5.2 过充 Over charge.....	8
5.3 过放 Over discharge.....	8
5.4 跌落 Drop.....	8
5.5 震动 Vibration.....	8
<b>6. 电池允许焊接部位 Welding allowable part on a battery.....</b>	<b>9</b>
<b>7. 出货状态 Charge state at shipment.....</b>	<b>9</b>
<b>8. 保证 Warranty.....</b>	<b>9</b>
<b>9. 使用注意事项 Handing warning.....</b>	<b>9</b>
<b>10. 电芯尺寸 Battery dimension.....</b>	<b>11</b>
<b>11. 喷码说明 Code Description .....</b>	<b>11</b>

	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	4 / 11

### 1. 适用范围 Scope

本规格书适用HL14500R 圆柱型锂离子二次电池。

This specification is applied to Lithium-ion rechargeable battery for HL14500R

### 2. 产品内容 Product content

#### 2.1 品名 Product name

锂离子二次电池

Lithium-ion rechargeable battery

#### 2.2 产品型号 Model of product

HL14500R

### 3. 产品规格 Product specifications

编号 No.	项目 Item	条件 Conditions	标准 Specifications
3.1	标准容量 Standard capacity	标准充电 <sup>1</sup> 后、使用标准放电 <sup>2</sup> 释放出的容量 At standard charging <sup>1</sup> and standard discharging <sup>2</sup> .	Type: 750mAh Min: 700mAh
3.2	标准电压 Nominal voltage	标准充电后、标准放电过程中的平均电压 Mean operation voltage during standard discharge after standard charge.	3.6V
3.3	放电截止电压 Discharge Cut-off Voltage		2.0V
3.4	放电终止电压 Final discharging voltage		2.75V
3.5	充电限制电压 limited charge voltage		4.2V
3.6	充电上限电压 Upper charge voltage		4.2V

<sup>1</sup> 标准充电：25±2℃的环境中，使用 350mA (0.5C) 电流，4.2V CC/CV 模式充电至电流 14mA。  
standard charge: CC:350mA and CV:4.2V charge for cut-off current 14mA at 25±2℃.

<sup>2</sup> 标准放电：25±2℃的环境中、恒流 (140mA=0.2C) 持续放电至放电终止电压 2.75V。  
standard discharge: CC:140mA=0.2C discharge till end of discharge voltage=2.75V at 25±2℃.

CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	5 / 11
3.7	最大连续充电电流 Maximum continuous charge current			1C(700mA)
3.8	最大连续放电电流 Maximum continuous discharge current			20C(14000mA)
3.9	重量 Weight			约 19.5g Approx. 19.5g
3.10	使用温度范围 Operating temperature range	充电 Charge		-20~60℃, -20<T≤0℃; 0.1C to 4.2V 0<T≤10℃; 0.2C to 4.2V 10<T≤45℃; 1C to 4.2V 45<T≤60℃; 0.5C to 4.2V
		放电 Discharge <sup>3</sup>		-40~85℃, 0≤T≤85℃; 2.75V(Max 3.5A) -30≤T<0℃; 2.0V(Max 3.5A) -40≤T<30℃; 2.0V(Max 2.1A)
		存储 Storage (≥60℃存储时, 最大充电电压≤4.05V ≥ 60 ℃ storage, maximum voltage ≤4.05V)		-40~85℃
3.11	保存温度 Storing temperature range  (无明显结露现象, 设定某一具体温度而非热冲击实验) (non-condensing, set an exact temperature and not suitable for thermal shock test) )	80%容量恢复率 The 80% or more capacity recovery rate		
		15 天内	Within 15days	-40~ 85℃
		30 天内	Within 30days	-40~ 60℃
		0~3 个月	0 – 3 months	-20~ 45℃
		0~12 个月	0 – 12 months	-20~ 25℃
<hr/> <sup>3</sup> 电芯表面温度不允许超过 90℃ The cell temperature is not allowed to be higher than 90 ℃				

CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	6 / 11

#### 4. 性能及测试 Performance and test conditions

编号 No.	项目 Item	条件 Conditions	标准 Specifications												
4.1	外观 Outside appearance	目视检查。 Visual check	无污渍、伤痕、变形等 No prominent stain, deformation, nor damage.												
4.2	外部尺寸 Outside dimensions	JIS B 7507 中指定的卡尺测定（最小刻度 0.05mm）。 Use caliper (0.05mm a division) specified in JIS B 7507.	(见附件图纸) (See attached drawing.)												
4.3	不同温度放电时间 Discharge time at different temperatures (此项测试中, 不同温度放电方式参照 3.8,) (In this test, discharge method refer to 3.8)	标准充电后、使用下表中的放电条件放电至终止电压, 满足对应条件下的容量要求。 Measure discharge time at the discharge temperature mentioned hereunder after standard charge.	大于下表中标准值 The discharge time shall be more than the value in the table below.												
		放电电流 Discharge current	放电温度 Discharge temperature (放电时间单位:分 Unit: minute)												
		140mA	<table border="1"> <tr> <td>-40°C</td> <td>-30°C</td> <td>-20°C</td> <td>0°C</td> <td>25°C</td> <td>60°C</td> <td>85°C</td> </tr> <tr> <td>120</td> <td>180</td> <td>200</td> <td>230</td> <td>300</td> <td>290</td> <td>290</td> </tr> </table>	-40°C	-30°C	-20°C	0°C	25°C	60°C	85°C	120	180	200	230	300
-40°C	-30°C	-20°C	0°C	25°C	60°C	85°C									
120	180	200	230	300	290	290									
4.4	出货电阻 Internal resistance at delivery	出货后一周内以 1kHz 频率交流测定 The battery impedance shall be measured by AC method (1kHz) within 1 week after delivery.	30mΩ 以下 30mΩ or less												
4.5	开路电压 Open circuit voltage	标准充电后、24 小时内测定。 Voltage within 24 hours after standard charge.	4.0V 以上 4.0V or more												
4.6	出货时开路电压 Open circuit voltage at delivery	出货后一周内 20±5°C 温度测定。 Voltage within 1 week after delivery	3.50~3.58V												
4.7	循环寿命 Cycle life(1C/1C)	25±2°C 的环境中, 电池使用 1C 充放电的模式进行 500 次的充放电循环之后, 使用标准充、放电方法测定电池的放电时间。 After 500 cycles of 1C charge and discharge at 25±2°C charge at standard charge and then measure discharge time at standard discharge.	循环结束后 210 分钟以上 210 minutes or more												

CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R	
	文件编号 Document No.	TBD	文件版本 Revision	A	
	日期 Data	2024-06-03	页码 Page	7 / 11	
4.8	保存特性 Storage characteristics	按照下表中的保存温度保存，保存完成后在 20±2℃ 的环境中采用标准放电模式，放电容量为残存容量。之后，使用标准充电模式充电，再使用标准放电模式放电，所得放电容量为恢复容量。 The battery is stored at a specified environmental temperature for a specified period. After that, the battery is standardly discharged, and the discharge time is measured as residual capacity. Moreover, the battery is standardly charged and discharged, and then measuring discharge time as recovery capacity.		高于下表所示时间 Longer than times specified below	
	荷电状态 Charge state of the battery	保存温度 Storage temperature <sup>4</sup>	保存时间 Storage period	容量Capacity（单位:分 Unit: min.）	
				残存容量 Residual capacity	恢复容量 Recovery capacity
	标准充电后 After standard charged	20℃	30 日 30 days	>665	>686
60℃		30 日 30 days	>595	>665	
85℃ <sup>55</sup> (见下注)		1000 小时 1000hours	\	>595	
<p><sup>4</sup>试验应使用纳入后不超过一周的新电池进行测试。&gt;60℃ 存储时，最大充电电压≤4.05V The tests specified above should be performed with new battery packs within 1 week after delivery, ≥ 60 °C storage, the maximum charge voltage of cell is ≤4.05 V.</p> <p><sup>5</sup>在 85℃ 存储测试中，充放电电压范围是 4.05-2.75V。当电压下降到 3.7V 时，25±2℃ 0.2C 充电至 4.05V 继续存储。 In 85 °C storage test, charge and discharge voltage range is 4.05 ~ 2.75V. When voltage drop to 3.7V, 25±2℃ 0.2C charge the cell to 4.05V and go on with the storage.</p>					

CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	8 / 11

### 5.安全性 Safety

编号 No.	项目 Item	条件 Conditions	标准 Specifications
5.1	外部短路 External short circuit	标准充电后电池以 $80\pm 20\text{m}\Omega$ 导线联通正负极短路 1 小时以上。 After standard fully charged, the positive and negative terminals of the battery is shorted by a wire of $80\pm 20\text{m}\Omega$ , and then left for 1 hour.	无爆炸、起火 No explosion and flame
5.2	过充 Over charge	电池按标准规定方法充电后, 继续 1C 充电 1h 或者充电至额定电压的 1.5 倍, 观察 1h After being fully standard charged, the cell is charged by 1C for 1h or charged to 1.5 times the max voltage, and then observe for 1h.	无爆炸、起火 No explosion and flame.
5.3	过放 Over discharge	电芯按规定充电结束后, 以 1C 电流放电 90min, 观察 1h。 After standard fully charged, the cell is discharged by 1C current for 90 min, and then observed for 1 hour.	无爆炸、起火 No explosion and flame.
5.4	跌落 Drop	常温下将充满电的、未循环使用过的电芯按 1m 的跌落高度自由落体跌落于水泥路面上。电芯两个端面各跌落 1 次, 圆柱面跌落 2 次, 共计进行 4 次跌落试验, 放置 1h 再观察外观。 Drop fully charged, unused cells from a free fall height of 1m onto a concrete road surface at room temperature. Each end face of the cells is dropped once, and the cylindrical surface is dropped twice, for a total of 4 drop tests. Leave the cells for 1h and then inspect their appearance.	无爆炸、起火 No explosion and flame.
5.5	震动 Vibration	将满电电芯放在振动实验台上, 在 90-100mins 由 10 Hz 到 55 Hz 再到 10Hz 以 1Hz/min 的速率变化, 振幅为 0.8mm(0.060 英寸)进行振动实验。电芯在电芯的轴向和与电芯轴向垂直的两个方向上振动。 Place fully charged cells on the vibration test table, and subject them to vibration for 90-100 minutes at a rate of 1 Hz/min, changing from 10 Hz to 55 Hz and back to 10 Hz, with an amplitude of 0.8mm (0.060 inches) in the axial and perpendicular directions of the cells	无爆炸、起火和漏液 No explosion, flame and leakage.

	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	9 / 11

## 6. 电池允许焊接部位 **Welding allowable part on a battery**

电池负极端中心 2 mm 范围内不可焊接。

Welding is not allowed on the central 2 mm diameter in a battery bottom face (negative terminal).

电池侧壁不可进行焊接。

Welding is not allowed on a battery side wall.

## 7. 出货状态 **Charge state at shipment**

电池预充电 $\leq 30\%$ 电量。

The battery is less than 30% SOC.

## 8. 保证 **Warranty**

由本公司生产的、符合本规格书要求的电池产品，使用者纳入后一年以内，如因电池材料、制造工艺上面的原因造成的失效或故障，本公司负责免费更换或者维修。

Our corporation warrants the product is to be free from defects in materials and workmanship for a period of one year from the date of delivery. During the one-year warranty period, Our corporation will repair or replace with new product free of charge, if any fault, which is due to material or workmanship evidently, occurs.

## 9. 使用注意事项 **Handling warning**

使用本规格产品，应遵守本规格书以下内容。超出以下使用条件，可能会导致破裂、发火、冒烟以及导致严重的性能失效和应用安全隐患，请务必仔细阅读以下内容。为了消除来自应用设备对电池的电气和机械压力，相关的警告信息应在说明书中明确标出。

When using the products, the following contents of this specification should be followed. Exceeding the following usage conditions may cause rupture, fire, smoke, and serious performance failure and application safety hazards. Please be sure to read the following contents carefully. To eliminate the electrical and mechanical stress on the battery from the application equipment, the relevant warning information should be clearly marked in the manual.

- 应使用专用的充电装置充电。

Use specified charger

- 应遵守本公司制定的充放电制度。

Use specified charge/discharge conditions

- 请不要用于指定设备以外的用途。

Specified product use only

- 正负极端子间不要被金属物品短路

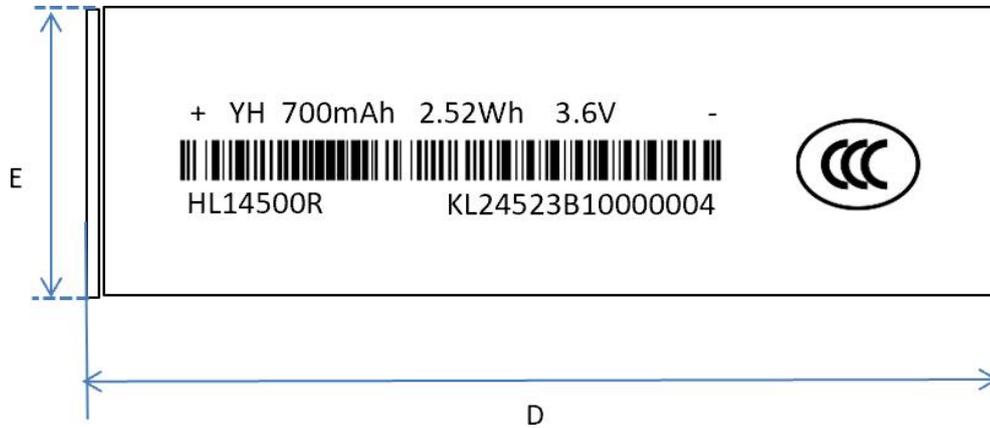
Do not short terminals

	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	10 / 11

- 请勿沾水或者投入水中。  
Do not immerse in water or pour
- 请勿加热，切勿投入火中。  
Do not heat or throw in fire
- 35℃以下、湿度 75%以下的清洁、干燥、通风良好的室内保存，远离热源、日光直射以及腐蚀性物品的接触。  
Store the battery in the warehouse with the temperature lower than 35℃, relative humidity less than 75%, clean, desiccation and ventilation. Keep the battery away from fire and heat sources, the direct sunlight and corrosive matters.
- 禁止挤压或者随意跌落  
Do not attempt to crush or drop
- 请勿拆卸、改动电池构造  
Do not attempt to disassemble or modify
- 请勿直接焊接电池（锡焊等热焊接方式）  
Please do not weld the battery directly (such as soldering or other thermal welding methods).
- 电池请勿放入微波炉、烤箱或者高压容器内  
Do not put it in microwave oven, oven or pressure container
- 妥善包装后方可运输，运输过程中请勿剧烈振动、冲击、挤压、阳光直射以及雨淋。可使用汽车、火车、船舶、飞机等运输，运输中产品周围温度不应超过 45℃。  
The battery must be packed before shipping. Prevent the battery from severe vibration, attacking, squeezing, direct sunlight and rain during transportation. Being shipped by the automotive, train, ship and plane is suitable. And the temperature around the package must be lower than 45℃.
- 如果按照标准充电方式在规定的充电时间范围内没有完成充电，请立刻停止充电  
If the charging time is longer than specified, stop charge
- 电池组在充电、使用、保存时等情况下出现发热、异味、变色变形等异常情况，请勿继续使用  
During charging, normal use and storage of battery pack, such as smell, change of color, mechanical abuse is detected, do not use
- 如果电池泄漏或者有异味产生，请远离火源，此外如果有液体沾染皮肤，请立刻用清水清洗干净。  
If the battery leaks or has a strange smell, please stay away from the fire source. Also, if the liquid gets on the skin, please wash it clean with clean water immediately.
- 如果出现漏液、液体进入眼中，请立即用大量清洁水冲洗，随后立即咨询就医  
In case of solvent in your eye, wash off with clean natural water and consult your doctor.

CMB	产品名称 Production name	14500 LIBs	产品型号 Model	14500R
	文件编号 Document No.	TBD	文件版本 Revision	A
	日期 Data	2024-06-03	页码 Page	11 / 11

### 10. 电池尺寸 Battery dimensions



No	项目 Items	尺寸 Dimension	备注 Remark
D	电池长度 Battery length	48.8±0.3 mm	1. 尺寸包括 PET 套筒 Dimensions include PET sleeve
E	电池直径 Battery diameter	14.2±0.2 mm	

### 11. 喷码说明 Code Description

例如: 14500R 700mAh 3.6V 2.52Wh KL24523B10000004

14500R: 产品型号, 700mAh: 额定容量

3.6V: 标称电压, 2.52Wh: 额定能量;

**KL230523B10000004**

