

# **PRODUCT SPECIFICATION**

**Rechargeable Lithium Ion Battery**

**Model : HW 38120HP 8000mAh/3.2V**



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## 1. Scope

This specification describes the type and size, performance, technical characteristics, warning and caution of the lithium ion rechargeable cell. The specification only applies to HW 38120HP cell supplied by Xinhai Energy Technology Co., Ltd.

## 2. Definition

### 2.1 Rated capacity:

Rated capacity =8000mAh, the capacity obtained when a cell is discharged at 1-hour rate to voltage 2.5 V at  $25 \pm 2.5^\circ\text{C}$ .

### 2.2 Standard charge method:

At  $25 \pm 2.5^\circ\text{C}$ , charged to 3.65V at a constant current of 3C, and then, charged with constant voltage of 3.65V until the charged current drops below 0.01C.

### 2.3 Standard discharge method:

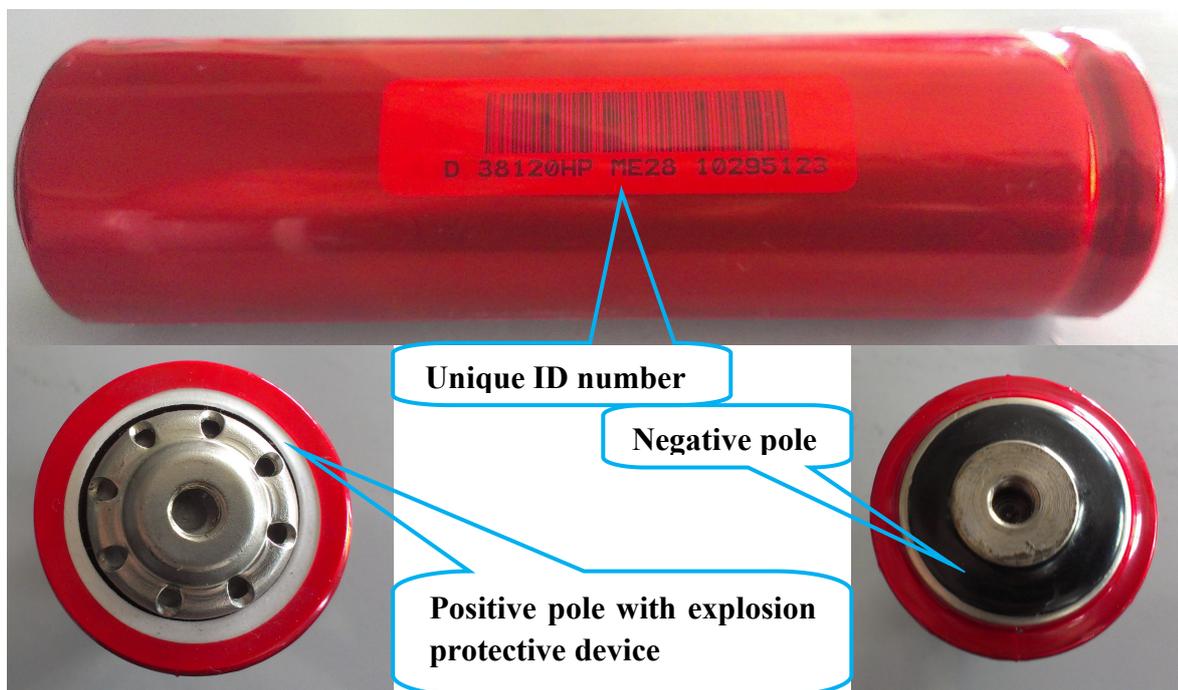
At  $25 \pm 2.5^\circ\text{C}$ , discharged to 2.5 V at a constant current of 5C.

## 3. Cell type, bar code, appearances, and dimensions

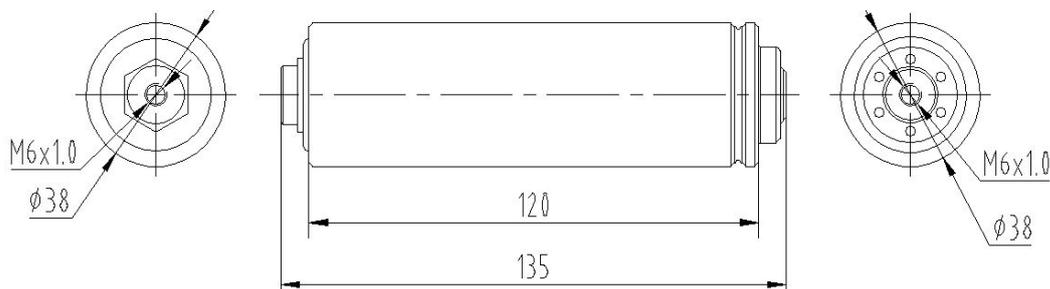
### 3.1 Cell type

HW 38120HP

### 3.2 Cell bar code and appearances



### 3.3 Cell dimensions:



**4. Cell specification (fresh cell tested at  $25 \pm 2.5^{\circ}\text{C}$ , using standard charge and discharge unless otherwise specified)**

ITEM	SPECIFICATION
Nominal capacity	8Ah @ 1C
Minimum capacity	7.5Ah @ 1C
Nominal voltage	3.2V
Max Charging voltage	$3.65 \pm 0.05$ V
Discharge ending voltage	$2.5 \pm 0.05$ V
Charge current	Standard charge: 3C Max charge: 10C when $T \geq 10^{\circ}\text{C}$ Max charge: 3C when $10^{\circ}\text{C} > T \geq 0^{\circ}\text{C}$ Max charge: 0.1C when $0^{\circ}\text{C} \geq T \geq -10^{\circ}\text{C}$
Discharge current	Standard discharge: 5C Max continuously discharge: 15C Max instant (30s) discharge: 30C
Charge and discharge cell surface temperature rise	5C continuously discharge: $\leq 15^{\circ}\text{C}$ 10C continuously discharge: $\leq 25^{\circ}\text{C}$
Recommended charge and discharge cell surface temperature	Charge: $0 \sim 45^{\circ}\text{C}$ Discharge: $-20 \sim 60^{\circ}\text{C}$
Maximum allowable charge and discharge cell surface temperature. Charging and discharging at these conditions will shorten cell cycle life.	Charge: $60^{\circ}\text{C}$ Discharge: $75^{\circ}\text{C}$
Humidity range	$0 \sim 90\%$ RH (noncondensing)
Internal resistance	$\leq 4\text{m}\Omega$ (AC Impedance, 1000HZ)
Cell dimension	Height: 136 mm Max Diameter: 38.5mm Max
Weight	$\leq 350\text{g}$

**5. Technical characteristics**

**5.1 Electronic performance (fresh cell tested at  $25 \pm 2.5^{\circ}\text{C}$ , standard charge and discharge unless otherwise specified)**

NO.	ITEM	CRITERION	
5.1.1	Discharge rate capability	<u>discharge capacity at 5C</u> discharge capacity at 0.5C	$\geq 100\%$
		<u>discharge capacity at 10C</u> discharge capacity at 0.5C	$\geq 100\%$

		<u>discharge capacity at 15C</u> discharge capacity at 0.5C	≥100%
5.1.2	Cycle life	<u>discharge capacity of 2000<sup>th</sup> cycle</u> original discharge capacity	≥80%
		<u>discharge capacity of 1500<sup>th</sup> cycle(3C/10C)</u> original discharge capacity	≥80%
5.1.3	High-Low temperature discharge performance (0.5C discharge)	<u>discharge capacity at -10°C</u> discharge capacity at 25°C	≥60%
		<u>discharge capacity at 0°C</u> discharge capacity at 25°C	≥75%
		<u>discharge capacity at 60°C</u> discharge capacity at 25°C	≥97%
5.1.4	Storage performance	<u>residual capacity after 28d storage</u> original discharge capacity	≥97%
		<u>recover capacity after 28d storage</u> original discharge capacity	≥99%

## 5.2 Environmental and safety characteristics

ITEM	TEST METHOD	CRITERION
5.2.1 Over discharge	Under the battery discharge to the cut-off voltage, then discharge with 0.1C, until the voltage of battery is zero.	No explosion, no fire, no leakage
5.2.2 Over charge	After the battery fully charge, overcharge with 0.5C for one hour.	No explosion, no fire, no leakage
5.2.3 reverse charge	After the battery fully charge, with 1/6C reverse current constant current charging for 8h.	No explosion, no fire, no leakage
5.2.4 130°C high temperature	After the battery is fully charged, the battery is placed in the oven for 3°C ~ 7°C / min heating rate, the temperature rose to 130°C after the start time, and (130 ± 2)°C temperature range of security within 1h.	No explosion, no fire, no leakage
5.2.5 High and low temperature impact	When the battery is fully charged, shelved at -40°C for 1h, then shelved 1h at 85°C, do such cycle for 32 times, then remove under room temperature for 6h.	No explosion, no fire, no leakage
5.2.6 Vibration	When the battery is fully charged, put the battery on the vibration table of amplitude 2mm, frequency 10Hz-30Hz for one hour.	No explosion, no fire, no leakage, no deformation.

5.2.7 Free fall drop	After the battery fully charge, let the battery fall from a height of 1.0m to the hard wood with thickness of 20mm, each surface for once.	No explosion, no fire, no leakage
5.2.1 Soaking	After the battery fully charged, the battery was sinked at room temperature, depth will be subject to immersion cell surface within 24 h, then take out under room temperature for 6 h.	No explosion, no fire, no leakage
5.2.8 Extrusion	After the battery is fully charged, the battery surface with special equipment was squeezed until the batteries dimensions changed to 1 ~ 3mm.	No explosion, no fire
5.2.9 Short circuit	When the battery is fully charged, with the internal resistance of not more than 50mΩ wires connecting to the battery positive and negative extremes for 1h.	No explosion, no fire, no leakage
5.2.10 Constant temperature/humidity/heat	After the battery fully charged the in the relative humidity of 90% ~ 95% of the constant temperature and humidity box, duration of 48 h, then take out under room temperature for 6 h.	No explosion, no fire, no leakage
5.2.11 Nail	A nail (diameter : 2.5~5mm) is penetrated vertically through the center of the fully charged cells.	No explosion, no fire, no leakage

## 6. Warning in handling the lithium-ion cell

To prevent the possibility of the cell from leaking, heating, explosion, please observe the following precautions:

Don't immerse the cell in water;

Don't use and leave the cell near a heat source such as fire or heater;

When charging, use a cell charger specifically for that purpose;

Don't reverse the positive and negative terminals;

Don't discard the cell in fire or heater;

Don't connect the cell to an electrical outlet directly;

Don't discard the cell in fire or heater;

Don't connect the positive and negative terminal directly with metal objects;

Don't transport and store the cell together with metal objects such as necklaces, hairpins;

Don't directly solder the cell;

Don't pierce the cell with a nail or other sharp object.

## 7.Shipping

The capacity of delivery battery is approximately at 50% of charging. During transportation , keep the battery from acutely vibration, impacting, solarization, drenching.