

# NEWPORT™

LITHIUM BATTERY

36V40Ah/1440Wh

24B1000206

LiFePO4



NEWPORT™

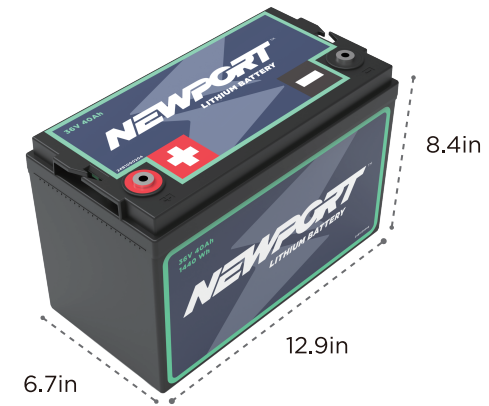
newportvessels.com

(866)721-0002

support@newportvessels.com



## PRODUCT OVERVIEW



### TERMINAL & POST BOLTS

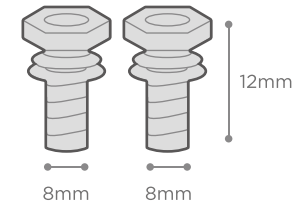
Terminal Size:

M8(1.25mm Metric Thread)

Post Bolts:

M8(1.25mm Metric Thread \* 12mm Bolt Length)

(The bolts can be replaced with M8 bolts of other lengths based on actual needs.)



## GENERAL INFORMATION

### BATTERY

Combination: 36V40Ah

Dimension: L12.9 \* W6.7 \* H8.4inch

Plastic Shell Color: Black

Operating Voltage: 38.4V

Charging Voltage: 45V

Max Continuous Load Power: 1440W

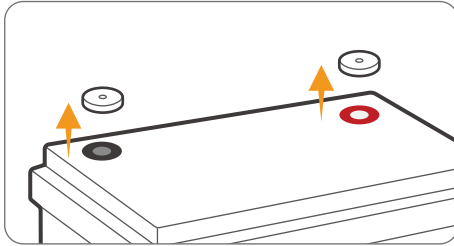
Max Continuous Charge / Discharge Current: 40A

# ≡ NOTICE BEFORE USING

Step  
1

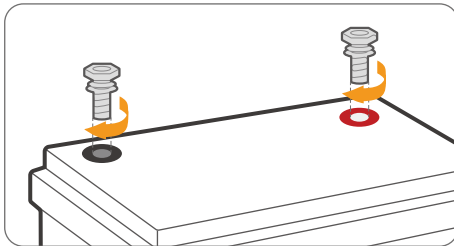
**CONTACT US** at [support@newportvessels.com](mailto:support@newportvessels.com) to activate the **FIVE-YEAR WARRANTY**

Step  
2



**PULL OUT** Insulating Plugs

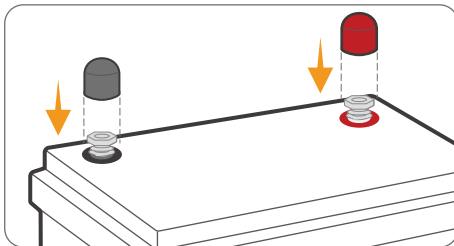
Step  
3



**TIGHTLY SCREW IN** post bolts

⚠ Please tightly screw in the post bolts. Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.

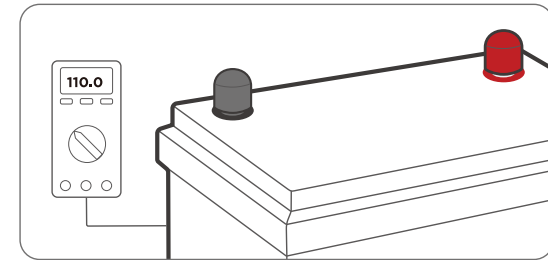
Step  
4



**PUT ON** insulating covers

Please put on the insulating covers to avoid metal or conductive objects touching the positive and negative terminals of the battery at the same time, otherwise it is likely to cause a short circuit.

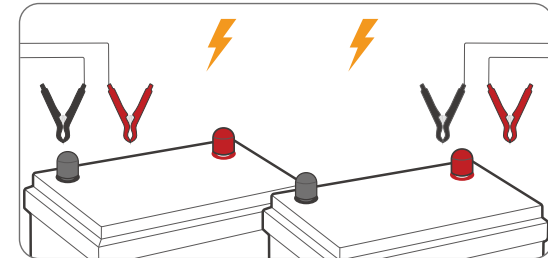
Step  
5



**TEST** The Battery Voltage with Multimeter

≥ 36V to Step 6  
< 36V Contact us at [support@newportvessels.com](mailto:support@newportvessels.com) to help solve the problem

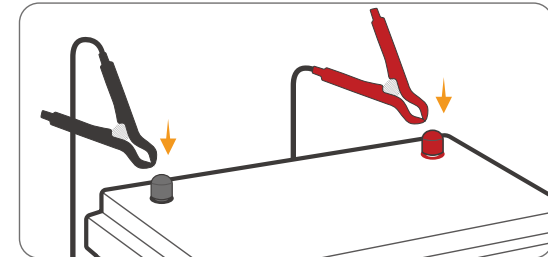
Step  
6



**FULLY CHARGE** Each battery separately

Refer to page 04 for battery charging methods

Step  
7



**CONNECT** To Use



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## ≡ BATTERY-PACK MAIN PARAMETERS

Cell	Prismatic LiFePO4 Battery
Nominal Capacity	40Ah
Usable Capacity	40Ah
Nominal Voltage	38.4V
Energy	1440Wh
Charge Method	CC/CV
Charge Voltage	45V
Recommend Charge Current	8A (0.2C)

Battery Management System (BMS) Board	50A
Max. Continuous Charge / Discharge Current <sup>1</sup>	50A
Max. Discharge Current 5 Seconds	150A
Max. Continuous Load Power <sup>2</sup>	1440W

The maximum continuous current that the battery can withstand.  
The maximum continuous output power that the battery can support.

Cycle Life	≥3000 times
Internal Impedance	≤20mΩ
Battery Pack Case	Acrylonitrile Butadiene Styrene (ABS) Plastic
Protection Class	IP65
Dimension	L 12.9 * W 6.7 * H 8.4 inch
	L329*W172* H214mm
Temperature Range	Charge: 0°C to 50°C / 32°F to 122°F
	Discharge: -20°C to 60°C/ -4°F to 140°F
	Storage:-10°C to 50°C/ 14°F to 122°F

## THINGS TO KNOW

BEFORE USING

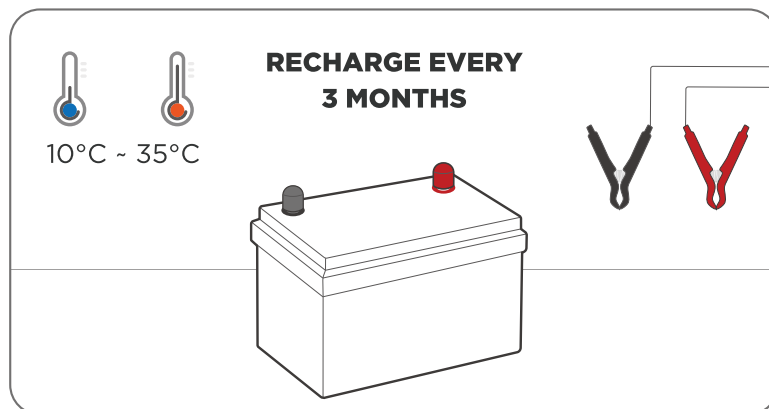
- Always put the insulating covers on the post bolts to avoid metal or conductive objects touching the positive and negative terminals of the battery at the same time, otherwise it is likely to cause a short circuit.
- Install the battery upright with post bolts facing up it cannot be mounted upside down. If you need to mount the battery on its side, please contact [support@newportvessels.com](mailto:support@newportvessels.com) to confirm this orientation is acceptable.
- Tightly screw in the post bolts. Having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.
- This battery is not intended to be used to start any devices, please **DO NOT USE IT AS A STARTING BATTERY.**
- Suggestions for **Long-Term Storage:**

### Temperature

The battery can be operated at a temperature of -20°C to 60°C/-4°F to 140°F, and temperature between **10°C to 35°C/50°F to 95°F** is ideal for long-term storage. Store in a fireproof container and away from children.

### Capacity

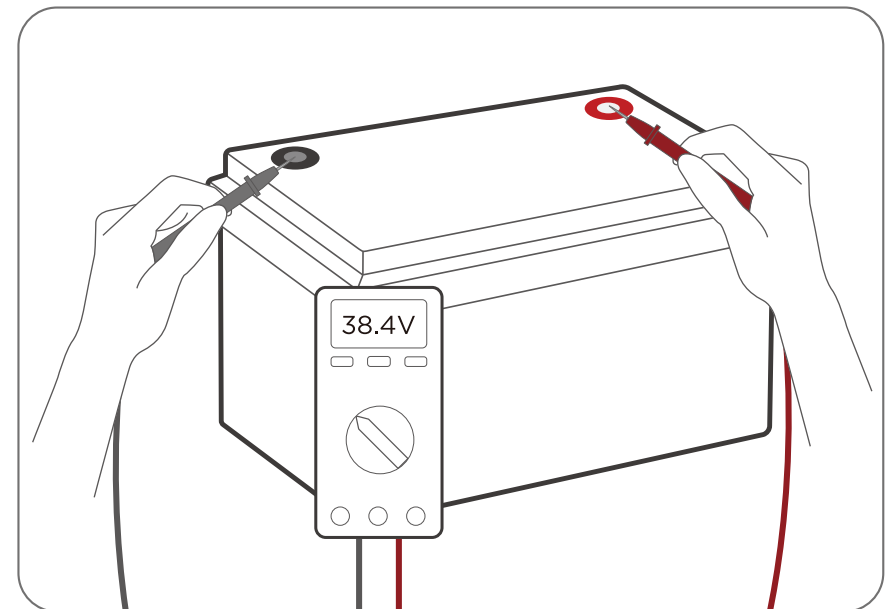
For a longer-lasting product, it is best to store your battery **at a 50% charge level** and recharge every three months if it is not going to be used for a long time.



## CHARGING METHODS

### THE VOLTAGE WHEN CHARGING & DISCHARGING

- Based on the characteristics of Lithium Iron Phosphate (LiFePO<sub>4</sub>) batteries, the voltage measured by all LiFePO<sub>4</sub> batteries **during charging/discharging is not the real voltage of the battery.** Therefore, after charging/discharging and disconnecting the battery from power source, the voltage of the battery will gradually drop/increase to its real voltage. If you need to test the voltage of the battery please disconnect all the connections to the battery and test its voltage after putting it aside for over 30 mins.



### Tips When Testing The Battery Voltage with a Multimeter

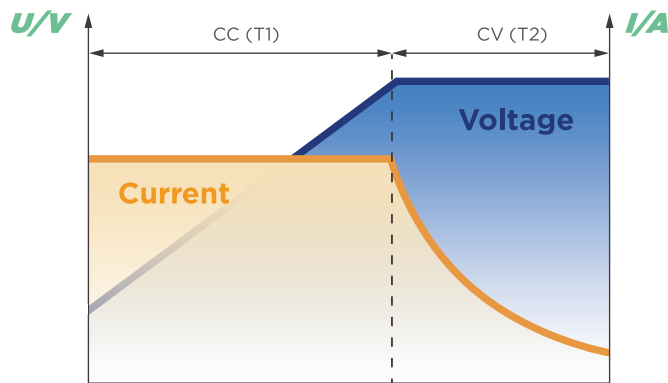
1. Put the red probe (+) **tightly** on the positive terminal (not the post bolts), and the black probe (-) on the negative terminal.
2. Do not touch the metal part of the probes with your hands during use.

## BATTERY CHARGING LOGIC

The material characteristics of the LiFePO4 battery is determined that **its charging curve is obviously different from that of a lead-acid battery**. Compared with a lead-acid battery, the LiFePO4 battery has a simpler charging process and mode. Therefore, it is recommended to select LiFePO4 for your charging mode.

If LiFePO4 mode is not available, please refer to the recommended parameters on Page 07-08 for setting.

### LiFePO4 Battery Charging Mode



LiFePO4 Battery Charging Curve

#### CC (Constant Current) Phase (T1)

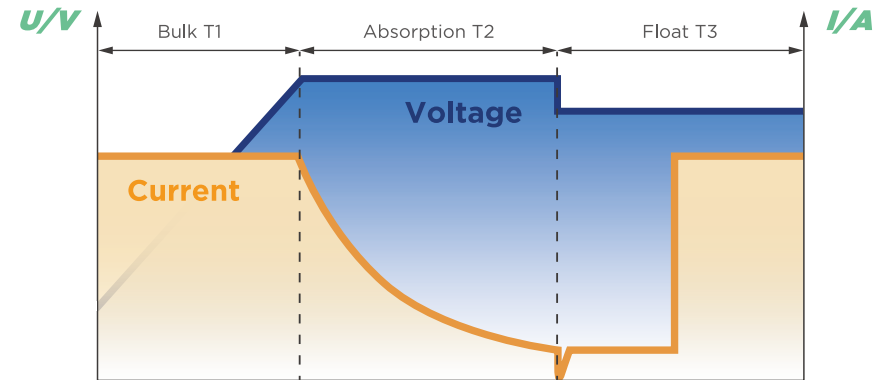
In the beginning, a discharged battery will be charged with a constant current and voltage will be climbing steadily until reaching the constant voltage set point which varies for different charging methods.

#### CV (Constant Voltage) Phase (T2)

The battery maintains a constant voltage during this phase while the current gradually decreases to 1A (0.02C) which is also known as tail current<sup>1</sup>. At his point, the charging is cut off and the battery is fully charged.

Tail Current (A) = Battery Capacity\* 0.02C. Eg,Ah\*0.02C = 1A tail current

### Lead Acid Battery Charging Mode



Lead Acid Battery Charging Curve

#### Bulk/Boost Phase (T1)

In the beginning, a discharged battery will be charged with a maximum current and voltage will be climbing steadily until reaching the absorption voltage set point.

#### Absorption Phase (T2)

The battery reaches the absorption voltage set point and holds the voltage constant while the current gradually decreases until the battery is becoming full (within 10-20%). Generally, absorption will not exceed 3 hours to prevent overcharging.

(This phase is basically equivalent to the CV phase of LiFePO4 battery charging.)

#### Absorption Phase (T2)

After the absorption stage, the voltage of the battery will reduce to the float voltage set point and the current will also be discharging and offsetting any self-discharge. Heavier battery discharge may set the controller back to Bulk/Boost or Absorption to replenish energy lost while energy is available.

(LiFePO4 battery does not have this charging phase.)

## SOLAR PANEL(S) & CONTROLLER

### Solar Panel

➤ **Recommend Power** ≥ 300W

The battery can be fully charged in one day (with effective sunshine 4.5hrs/day) by 300W solar panels.

It may take more than one day to fully charge the battery by ≥ 300W solar panels since the duration and intensity of light would be a great factor for their charging efficiency.

### Controller

➤ **Recommended Charging Current:**

8A (0.2C)	The battery will be fully charged in around 5 hrs to 100% capacity.
20A (0.5C)	The battery will be fully charged in around 2 hrs to around 97% capacity.

➤ **Recommended Charging Mode: 36V (45V) LI (LiFePO4)**

### Controller Settings

Refer to the below parameters if you need to manually set up your controller. As different types of batteries have different charging modes (refer to Page 05-06), **IT IS RECOMMENDED TO SET ONLY THE FOLLOWING PARAMETERS FOR LIFEPO4 BATTERIES.** The settings for other types of batteries do not apply to LiFePO4 batteries except for the following settings.

CHARGING	Charge/Bulk/Boost Voltage	45V
	Absorption Voltage	45V
	Over Voltage Disconnect	45V
	Over Voltage Reconnect	38.4V
	Tail Current	0.8A (0.02C)
DIS-CHARGING	Under Voltage Warning	/
	Under Voltage Recover	/
	Low Voltage Disconnect	30V
	Low Voltage Reconnect	32.4V

## BATTERY CHARGER

Use 30V lithium iron phosphate (LiFePO4) battery charger to maximize the capacity.

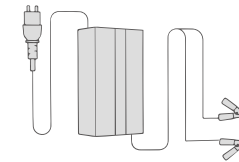
➤ **Recommended Charging Voltage:** 45V

➤ **Recommended Charging Current:**

8A (0.2C)	The battery will be fully charged in around 5 hrs to 100% capacity.
20A (0.5C)	The battery will be fully charged in around 2 hrs to around 97% capacity.

### Tips

Connect the charger to the battery before connecting it to the grid power in case of sparks. It's recommended to disconnect the charger from the battery after fully charging.



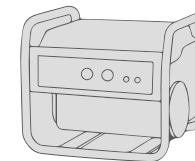
## ALTERNATOR / GENERATOR

Newport Battery can be charged by an alternator or generator. If the alternator/generator supports DC output, a DC-to-DC charger needs to be added between the battery and the generator; if the alternator/generator supports AC output, please refer to the recommendations in “Battery Charger” above to add a suitable battery charger between the batter and the generator.

➤ **Recommended Charging Voltage:** 45V

➤ **Recommended Charging Current:**

8A (0.2C)	The battery will be fully charged in around 5 hrs to 100% capacity.
20A (0.5C)	The battery will be fully charged in around 2 hrs to around 97% capacity.





HOW TO ESTIMATE

## ≡ THE BATTERY CAPACITY

### STATE OF CHARGE (SOC)

The battery capacity could be roughly estimated by **its rest voltage (not charging/discharging voltage)**. As there are subtle difference in the voltages of each battery, the below parameters are for reference only.

Rest Voltage: The voltage needs to be tested at rest (with zero current) after 30 mins of disconnecting fro the charger and loads.

CAPACITY	CHARGE VOLTAGE
100%	40.5V
99%	40.2V
90%	39.9V
70%	39.6V
40%	39.3V
30%	39V
20%	38.7V
10%	37.8V
1%	⚡ 32.4V (recommend low voltage disconnect voltage)
0%	28.5V

## SERIES/PARALLEL CONNECTION

### THE PREMISE OF CONNECTION

**The connect in series or/and parallel, batteries should meet the below conditions:**

- Identical batteries with the same battery capacity (Ah) and BMS (A);
- From the same brand (as lithium batteries from different brands have a unique BMS);
- Purchased in near time (within one month).

# INVERTER SETTINGS

## METHOD ONE (RECOMMENDED)

Select **“24V (25.6V) LI (LiFePO4) Mode”**

## METHOD TWO

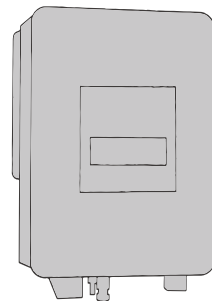
If method one is not available, select “User Mode” to enter values according to below parameters.

CHARGING	Charge Voltage	36V
	Over Voltage Disconnect	45V
	Over Voltage Reconnect	43.2V

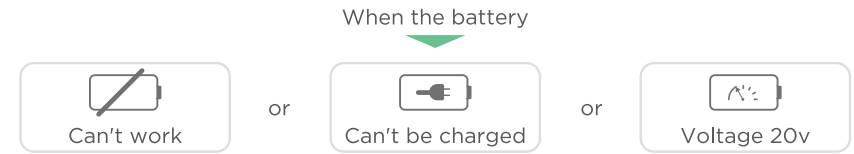
DIS-CHARGING	Under Voltage Warning	/
	Under Voltage Recover	/
	Low Voltage Disconnect	30V
	Low Voltage Reconnect	32.6V

The above setting parameters **apply to common inverters on the market** (such as Victron, Renogy, Growatt, Go Power, Lux Power, etc.). Different brands have slightly different descriptions or naming methods for each parameter. **Please directly set the parameters with the same meaning.**

If the inverter parameters to be set are special or cannot correspond to one of the above items, please [support@newportvessels.com](mailto:support@newportvessels.com) for help.



# WHAT TO DO WHEN THE BATTERY STOPS WORKING?

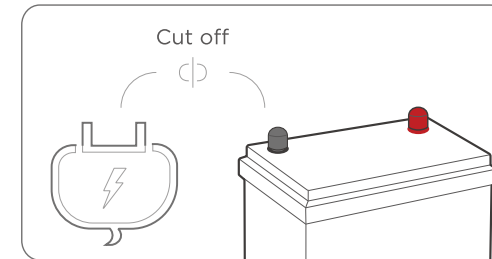


There is an 85% chance the BMS has shut off for protection. You can try one of the below ways to activate the battery.

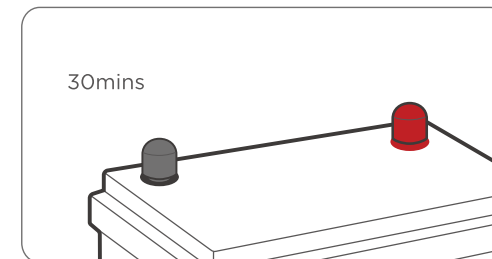
## GENERAL STEPS

If the BMS has cut off the battery for protection, follow the below steps to activate it.

**Step 1** **Unplug** all the connections from the battery



**Step 2** **Leave the battery aside for 30mins**  
Then the battery will automatically return to normal voltage (>20V) and can be used after being fully charged.



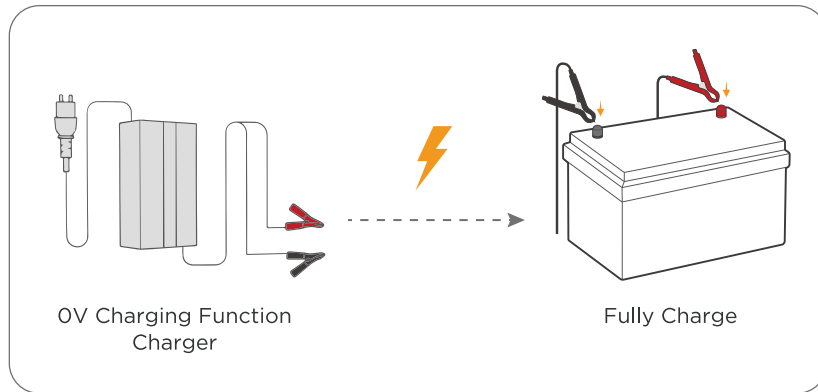
If the battery is unable to recover after the above steps, please try activating by:

### ONE OF BELOW TWO METHODS:

After activated (voltage > 30V) and fully charged by the normal charging method, it can be used normally.

#### Method 1

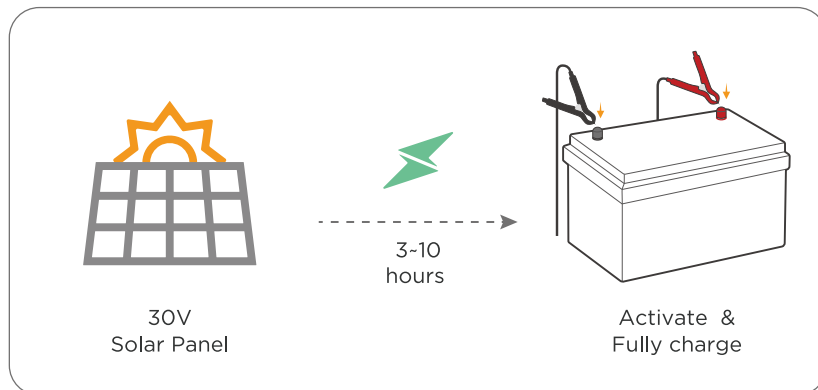
Use a **charger with a 0V charging function** to fully charge the battery!



The charger can charge the battery starting from 0V.

#### Method 2

Connect a **30V solar panel** to charge the battery for 3-10 hrs in sunny daytime.



## ATTENTION

**Caution:** Risk of Fire, Explosion or Burns

**DO NOT** Short Circuit

**DO NOT** Reverse connections from the charger to the battery

**DO NOT** Disassemble

**DO NOT** Throw into fire or incinerate

**DO NOT** Heat above 70°C/158°F

## WARNING

### BATTERY DISPOSAL

The electrodes of the waste battery should be wrapped with insulating paper to prevent fire and explosion.

### PROHIBITION OF DISASSEMBLY

**Never disassemble the cells.** The disassembling may generate an internal short circuit in the cell, which may cause gassing, fire, explosion, or other problems.

**The electrolyte is harmful.** Li-Fe battery should not have liquid from electrolyte flowing, but in case the electrolyte comes into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with the fresh water and medical advice is to be sought.

### PROHIBITION OF DUMPING OF CELLS INTO WATER

Do not soak the battery in liquid, like water, seawater and non-alcoholic drinks, fruit juice, coffee or other drinks.

### PROHIBITION OF DISASSEMBLY

If any abnormal features of the cells are found such as damages in a plastic envelope of the cell, deformation of the cell packaging, smell of an electrolyte leakage and others, the cells shall not be used.

The cells with a smell of electrolyte leakage shall be placed away from the heat to avoid fire or explosion.

### PROHIBIT USE IN FOLLOWING PLACES

**DO NOT** use the battery in a place with a strong static electricity or strong magnetic field, otherwise, it may damage the battery safety protection device.