



# MATERIAL SAFETY DATA SHEET

## SECTION 1 – PRODUCT AND MANUFACTURER INFORMATION

### PRODUCT COMPANY: PAC TECHNOLOGY CO., LTD

PAC Technology Co., Ltd is a high technology company specializing in the development, manufacture and marketing of Li-ion polymer batteries, Cylindrical Li-ion batteries and LiFePO<sub>4</sub> batteries. Its main purpose is to design and produce high performance rechargeable batteries.

**PRODUCT NAME:** Lithium ion Phosphate Rechargeable Battery.

**PRODUCT TYPE:** Battery

**NOMINAL VOLTAGE/VOLTAGE:** 25.6V

**Designated for recharge:** Yes

### HAZARD RATINGS\*

### Rating Key

0=minimal

1=slight

2=moderate

3=serious

4=severe

	<u>NPCA/HMIS</u>	<u>NFPA 704</u>
Health:	0	0
Flammability:	0	0
Reactivity:	0	0

NFPA = National Fire Protection Association

NPCA/HMIS = National Paint & Coatings Association/ Hazardous Materials Identification System



## SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

None of the ingredients in this product is considered to be hazardous.

MATERIAL OR INGREDIENT	CAS No.	Wt %
Lithium iron phosphate(LiFePO <sub>4</sub> )	15365-14-7	40
Lithium hexafluorophosphate(LiPF <sub>6</sub> )	21324-40-3	15
Copper(Cu)	7440-50-8	10
Graphite(C <sub>24</sub> X <sub>12</sub> )	7782-42-5	8
Aluminum(Al)	7429-90-5	5
Ethylene carbonate(C <sub>3</sub> H <sub>4</sub> O <sub>3</sub> )	96-49-1	5
Dimethyl carbonate(C <sub>3</sub> H <sub>6</sub> O <sub>3</sub> )	616-38-6	5
Lithium metal(Li)	7439-93-2	3
Polyvinylidene fluoride(C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> ) <sub>n</sub>	24937-79-9	6
Nickel(Ni)	7440-02-0	3

## SECTION 3 – HAZARDS IDENTIFICATION / EMERGENCY OVERVIEW

Nonflammable Solid

Inhalation: Product is not respirable.

Ingestion: Product cannot be ingested.

Skin Contact: No adverse effects expected

Eye Contact: No adverse effects expected. Product will not directly contact the eyes.

Carcinogenic: IARC- No, NTP - No, OSHA - No

PS: IARC = International Agency for Research on Cancer

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

### Specific hazards:

Corrosive gas may be emitted during fire.

### Special protective equipment for firefighters:

**Respiratory protection:** Respiratory equipment of a gas cylinder style or protection-against-dust mask

**Hand protection:** Protective gloves

**Eye protection:** Goggle or protective glasses designed to protect against liquid splashes

**Skin and body protection:** Protective clothes.

Production of MSDS proving UN Manual of Tests and criteria, Part 3, sub-section 38.9 is met.



## SECTION 4 – FIRST AID MEASURES

**Inhalation:** Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

**Ingestion:** No first aid needed.

**Skin Contact:** Remove contaminated clothes and shoes immediately. Immediately wash extraneous matter or contact region with soap and plenty of water.

**Eye Contact:** Do not rub eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

## SECTION 5 – FIRST FIGHTING MEASURES

**Nonflammable Solid:** This product will not burn.

**Extinguishing Media:** Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

**Special Fire - fighting Procedures or Equipment:**

When the battery burns with other combustibles simultaneously, take fire extinguishing method which corresponds to the combustibles. Extinguish a fire from the windward as much as possible.

**Hazardous Combustion Products:** None

**Unusual Fire /Explosion Hazards:** None

## SECTION 6 – ACCIDENTAL RELEASE MEASURES

Pick up and place in appropriate container

## SECTION 7 – HANDLING AND STORAGE

**Handling:** Accidental short circuit for a few seconds will not seriously affect the battery. However, this battery is capable of delivering very high short circuit currents. Prolonged short circuits will cause high temperature that can cause skin burns. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, and metal covered tables or metal belts used for assembly of batteries into devices. If soldering or welding to the battery is required, use of tab lead on the batteries is recommended. Do not open the battery. The negative electrode material



may be inflammable. Should an individual cell from a battery become disassembled, spontaneous combustion of the negative electrode is possible. There can be a delay between exposure to air and spontaneous combustion.

**Storage:** Store in a cool, well ventilated area. Elevated temperature can result in reduced battery cycle life.

## SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance/State: Solid

Odor: None

State	Solid
pH	N/A
Vapor Pressure	N/A
Boiling Point	N/A
Specific Gravity	N/A
Density	N/A

## SECTION 10 – STABILITY AND REACTIVITY

**Stability:** None is during normal operation. Avoid exposure to heat, open and corrosives.

**Reactivity :** None

## SECTION 11 – TOXICOLOGICAL

This product does not elicit toxicological properties during handling and use.

## SECTION 12 – ECOLOGICAL

This product is not expected to cause toxicity to the environment. Components of



this material are not biomagnified or bio-concentrated in the environment.

## **SECTION 13 – DISPOSAL CONSIDERATIONS**

This product may be disposed in a municipal landfill.

## **SECTION 14 – TRANSPORTATION**

**Note:** Lithium batteries is classified to Lithium Ion Batteries (including lithium ion polymer batteries) and Lithium Metal Batteries (including lithium alloy batteries).

Lithium batteries shipped as “Lithium batteries”, “Lithium batteries packed with equipment”, or “Lithium batteries contained in equipment” may not be classified as “Dangerous Goods” when shipped in accordance with “PI965-970 section II of IATA-DGR” or “special provision 188 of IMO-IMDG Code”.

**IATA: Proper Shipping Name:** Lithium ion batteries

**UN Number:** UN 3480

**Hazard Class:** 9

**Packaging requirement:** According to IATA DGR 60<sup>th</sup> Edition (Effective 1 January-31 December 2019), PACKING INSTRUCTION 965 of section IB for transportation.

**IMO: Proper Shipping Name:** Lithium ion batteries

**UN Number:** UN3480

**Hazard Class:** Not restricted

**Packing Group:** Not restricted

The goods are not restricted to IMO IMDG Code (Amend 38-2016) according to special provision 188.

## **SECTION 15 – REGULATORY**

This regulatory information included here should not necessarily be considered all inclusive. None of the ingredients in this products are subjected to the reporting requirements of the CERCLA, the Clean Air Act and the Clean Water Act(US). This product is not formulated with, nor do the manufacturing or formulation process utilize any Class I or II Ozone depleting substance.

## **SECTION 16 – OTHER INFORMATION**



The recommendation and information contained in this MSDS have been compiled from sources believed to represent the most current information available when the MSDS was prepared. However, the manufacturer/ distributor of this product provides any warranty, guaranty representation as to the correctness or sufficiency of this information. If this product is to be used in large amount and /or an unusual manner, the user is obliged to determine what safety measures are appropriate, including the applicable and relevant workplace and environmental regulations pertaining to handling, use and disposal.

#### Abbreviations used in this MSDS

CERCLA = Comprehensive Environmental Response Compensation and Liability Act

CFR = Code of Federal Regulations