

RELi³ON[®]

LITHIUM IRON PHOSPHATE
SAFETY DATA SHEET (SDS)

SECTION 1 - COMPANY AND PRODUCT IDENTIFICATION

Product Name: Lithium Iron Phosphate Rechargeable Battery
 Common Name: Lithium Iron Phosphate Battery LiFePO4)
 Product Use: Electric Storage Battery
 Distributed By: RELiON Battery, LLC
 Address: 4868 Harrisburg Rd, Fort Mill, SC 29707 USA
 Phone Number: 803-547-3522
 Fax Number: 803-547-3526
 Email: powerpros@reliombattery.com
 Emergency Number: 803-547-3522
 Revision Date: December 19, 2017

SECTION 2 - HAZARDS IDENTIFICATION

Emergency Overview: This product contains a chemical substance. Safety information is given for exposure to the product as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture, the below hazards exist.

CAS# 1333-86-4

Classification According to GHS

Self-heating substances and mixtures (1)
 Carcinogenicity (2)
 Specific target organ toxicity, repeated exposure (1) (lung)

Label Elements

Hazard Images:



Signal Word: Danger

Hazard Statements:

H251 Self-heating; may catch fire
 H351 Suspected of causing cancer
 H372 Causes damage to organs through prolonged or repeated exposure (lung)

Precautionary Statements:

Prevention:

P235 Keep cool.
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P280 Wear protective gloves, protective clothing, eye protection and face protection.
 P260 Do not breathe dust.
 P264 Wash skin and clothing thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.

Response:

P308 + P313 If exposed seek medical attention.
 P314 Seek medical attention if you feel unwell.

Storage:

P407 Maintain air gap between stacks or pallets.
 P413 Store bulk masses greater than ...kg/...lbs at temperatures not exceeding ...C
 P420 Store separately.
 P405 Store locked up.

Disposal:

P501 Contents require disposal at approved waste treatment plants.

CAS# 7440-50-8

Classification according to GHS

Sensitisation skin (1, 1A, 1B)
 Specific target organ toxicity, single exposure (1) (digestive system)
 Specific target organ toxicity, single exposure; Respiratory tract irritation (30)

Label Elements

Hazard Images:



Signal word: Danger

Hazard Statements:

H317 May cause allergic skin reaction.
 H370 Causes damage to organs (digestive system).
 H335 May cause respiratory irritation.



Prevention:

P260 Do not breathe dust, fume.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves, eye protection, face protection.
P264 Wash skin and clothing thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.

Response:

P302+P352 IF ON SKIN: Wash with plenty of water.
P333 + P313 If skin irritation or rash occurs: Seek medical attention.
P321 Specific treatment (See additional emergency instructions).
P362 + P364 Take off contaminated clothing and wash it before reuse
P308 + P311 IF exposed or concerned: Call a POISON CONTROL CENTER.
P312 Call a POISON CENTER if you feel unwell.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Contents handling to approved waste treatments.

CAS# 7429-90-5**Classification according to GHS**

Substances and mixtures which, in contact with water, emit flammable gases (2, 3)
Specific target organ toxicity, repeated exposure (1) (Lung)
Hazardous to the aquatic environment, long-term hazard (4)

Label Elements**Hazard Images:**

Signal word: Danger

Hazard Statements:

H261 In contact with water releases flammable gas.
H372 Causes damage to organs through prolonged or repeated exposure (Lung).
H413 May cause long lasting harmful effects to aquatic life.

Prevention:

P223 Do not allow contact with water.
P231 + P232 Handle and store contents under inert gas, protect with moisture.
P280 Wear protective gloves and clothing thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.

Response:

P302 + P335 + P334 IF ON SKIN: Brush off loose particles from skin and immerse in cool water.
P370 _ P378 In case of fire: use the appropriate media to put out the fire.
P314 Seek medical attention if you feel unwell.

Storage:

P402 + P404 Store in a dry place. Store in a closed container.

Disposal:

P501 Contents handling to approved waste treatment plants.

Other Hazards

Physical and Chemical hazards: See Section 10

Human Health Hazards: See Section 11

Environmental Hazards: See Section 12



SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization: Mixture

Chemical Composition	CAS No.	EC#	Weight (%)
Ferrous Phosphate Litium	15365-14-7	476-700-9	38.09
Carbon Black	133-86-4	215-609-9	0.62
Rubber, styrene-butadiene, fume	61789-96-6	612-382-1	0.34
Polyvinylidene fluoride resin	24937-79-9	607-458-6	1.04
Graphite	7782-42-5	231-955-3	20.10
Phosphate (1-), hexafluoro-, lithium	21324-40-3	244-334-7	1.10
Copper	744-50-8	231-159-6	9.22
Aluminium	7429-9-5	231-072-3	4.00

SECTION 4 - FIRST AID MEASURES

Description of First Aid Measures

General Information: No special measures required.

After Eye Contact

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.

After Skin Contact

Remove contaminated clothing and shoes. Immediately wash with water and soap, rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

After Inhalation

Remove victim to non exposed area. Administer artificial respiration if breathing is difficult. Seek medical attention.

After Swallowing

Do not induce vomiting. Get medical attention.

Personal protective equipment for first-aid responders: No data available

Most important symptoms/effects, acute and delayed: No data available

Indication of immediate medical attention and special treatment needs: No data available

SECTION 5 - FIRE FIGHTING MEASURES

Suitable extinguishing media:

Use extinguishing agent suitable for local conditions and the surrounding environment, such as dry powder, CO₂.

Unsuitable extinguishing media: No data available.

Specific Hazards Arising from the Chemical:

Special hazards arising from the substance or mixture

Battery may burst and release hazardous decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolytes that may vent, ignite and spark when subjected to high temperature (>150°C (302°F), when damaged or abused (e.g.) mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in close proximity.

Specific protective actions for fire-fighters:

Protective equipment: wear self-contained respirator. Wear fully protective impervious suit.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Protective Equipment: No data available.

Emergency Procedures: Remove ignition sources, evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible, place the spilled material into a suitable container for disposal. Keep spilled material out of sewers, ditches and bodies of water.

Environmental Precautions: Do not allow material to be released into the environment without proper governmental permits.

Methods and Materials for Containment and Cleaning Up:

All waste must refer to the United Nations, the national and local regulations for disposal.

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.



SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling:

Consumption of food and beverage should be avoided in work areas. Wash hands with soap and water before eating or drinking. Ground containers when transferring liquid to prevent static accumulation and discharge. Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Conditions for safe storage, including any incompatibilities:

Requirements to be met by storerooms and receptacles

Store in a cool, dry, well-ventilated place.

Information about storage in one common storage facility

Keep away from heat, avoiding long exposure to sunlight.

Further information about storage conditions

Keep container tightly sealed

Specific and use: No data available

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

CAS No.	ACGIH	NIOSH	OSHA
15365-14-7	N/A	N/A	N/A
1333-86-4	TVL-TWA 3mg/m ³	REL-TWA 3.5mg/m ³	PEL-TWA 3.5mg/m ³
61789-96-6	N/A	N/A	N/A
24937-79-9	N/A	N/A	N/A
7782-42-5	TVL-TWA 2mg/m ³	REL-TWA 2.5mg/m ³	PEL-TWA 15mppcf PEL-TWA 20mppcf
21324-40-3	N/A	N/A	N/A
7440-50-8	TVL-TWA 0.2mg/m ³ TVL-TWA 1mg/m ³	REL-TWA 1mg/m ³ REL-TWA 0.1mg/m ³	PEL-TWA 0.1mg/m ³ PEL-TWA 1mg/m ³
7429-90-5	TVL-TWA 1mg/m ³	REL-TWA 2mg/m ³ REL-TWA 5mg/m ³ REL-TWA 10mg/m ³	PEL-TWA 5mg/m ³ PEL-TWA 15mg/m ³

Appropriate engineering controls: The usual precautionary measures for handling chemicals should be followed.

Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work.

Personal Protective Equipment

Respiratory protection: Wear suitable protective mask in order to reduce the respiratory system. In case of leakage, wear chemical protective clothing, including self-contained breathing apparatus.

Hand protection: Wear appropriate protective gloves to reduce skin contact.

Eyes protection: Wear safety goggles or eye protection combined with respiratory protection.

Skin and body protection: Working environment required, wear suitable protective clothing to minimize contact with skin. The type of protective equipment must be according to the concentration and content of certain hazardous substances in the workplace.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Color: Black

Physical State: Prismatic

Odour: Not available

Odour Threshold: Not available

pH: Not available

Melting point/freezing point: Not available

Initial boiling point and boiling range: Not available

Flash Point: Not available

Evaporation Rate: Not available

Flammability (solid, gas): Not available

Explosion Limits (vol% in air): Not available

Vapour Pressure, kPa at 20°C: Not available

Vapor Density: Not available

Density/Relative Density (water=1): Not available

Solubility(ies): Not available

Partition Coefficient: n-octanal/water: Not available

Auto-ignition Temperature: Not available

Decomposition Temperature: Not available

Viscosity: Not available

Other Information: Not available

Voltage: 12.8V

Electric Capacity: 16000mAh

Electric Energy: 204.8Wh



SECTION 10 - STABILITY AND REACTIVITY

Reactivity: No data available

Chemical Stability: Stable

Possibility of Hazardous Reactions: No data available

Conditions to Avoid: Flames, sparks and other sources of ignition, incompatible materials

Incompatibilities Materials: Oxidizing agents, acid, base

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, lithium oxide fumes

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute Toxicity:

CAS No.	LC50/LD50
15365-14-7	No data available.
1333-86-4	LD50 Rat (oral): 15400 mg/kg
61789-96-6	No data available.
24937-79-9	No data available.
7782-42-5	No data available.
21324-40-3	No data available.
7440-50-8	No data available.
7429-90-5	No data available.

Skin Corrosion/Irritation: No data available

Serious Eye Damage/Irritation: No data available

Respiratory or Skin Sensitization: No data available

Germ Cell Mutagenicity: No data available

Carcinogenicity: No data available

Reproductive Toxicity: No data available

Specific Target Organ Toxicity-Single Exposure: No data available

Specific Target Organ Toxicity-Repeated Exposure: No data available

Aspiration Hazard: No data available

Information on the Likely Routes of Exposure: No data available

Eye: No data available

Skin: No data available

Ingestion: No data available

Inhalation: No data available

SECTION 12 - ECOLOGICAL INFORMATION

Ecological Toxicity: No data available

Persistence and Degradability: No data available

Bioaccumulative Potential: No data available

Mobility in Soil: No data available

Other Adverse Effects: No data available

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal Methods


Recommendation: Consult state, local or national regulations to ensure proper disposal.

Uncleaned Packaging

Recommendation: Disposal must be made according to official regulations.

SECTION 14 - TRANSPORT INFORMATION

Acute Toxicity:

UN Number	UN3480
IATA	UN3480
IMDG	UN3480
Model Regulation	UN3480
UN Proper shipping name	Lithium ion batteries
IATA	Lithium ion batteries
IMDG	Lithium ion batteries
Model Regulation	Lithium ion batteries
Transport Hazard Class (es)	
IATA	9
IMDG	9
Model Regulation	9
Packing group	N/A
IATA	N/A
IMDG	N/A
Model Regulation	N/A
Packing Sign	
IATA	
IMDG	
Model Regulation	
Environmental Hazards Marine Pollutant:	No
Special precautions for user	Not applicable



Transport Information:

RELiON LiFePO4 Batteries have passed the test UN38.3, according to the Report ID: MLINHTU74733721.

Watt-hour exceeds the standard, so it belongs to dangerous goods. The goods are packaged according to the packaging Instruction 965 Section IA of IATA DGR 58th Edition for transportation, Cargo aircraft only.

Watt-hour exceeds the standard, so it belongs to dangerous goods. The goods are packaged according to the special provision 230, 348 of IMDG (37-14).

Watt-hour exceeds the standard, so it belongs to dangerous goods. The goods are packaged according to the <<Recommendations On The Transport of Dangerous Goods-Model Regulations>> (19th).

Separate batteries to prevent short-circuiting and they should be packed in a strong package during transport. Lithium cell or battery should incorporate a safety venting device or be designed to prevent a violent rupture under normal transport conditions. Keep away from high temperature and open flames. Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.

Transport Fashion: By air, by sea, by railway, by road.

SECTION 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

CAS No.	LC50/LD50
15365-14-7	No data available.
1333-86-4	LD50 Rat (oral): 15400 mg/kg
61789-96-6	No data available.
24937-79-9	No data available.
7782-42-5	No data available.
21324-40-3	No data available.
7440-50-8	No data available.
7429-90-5	No data available.

SECTION 16 - OTHER INFORMATION

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Modification Record: Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above names supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although, certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Other Information:

CAS: (Chemical Abstracts Service)

EC: (European Commission)

ACGIH: (American Conference of Governmental Industrial Hygienists)

NIOSH: (US National Institute for Occupational Safety and Health)

OSHA: (US Occupational Safety and Health)

TLV: (Threshold Limit Value)

TWA: (Time Weighted Average)

STEL: (Short Term Exposure Limit)

PEL: (Permissible Exposure Average)

REL: (Recommended Exposure Limit)

PC-STEL: (Permissible concentration-time weighted average

PC-TWA: (Permissible concentration-short time exposure limit)

LC50: (Lethal concentration, 50 percent kill)

LD50: Lethal dose, 50 percent kill)

IARC: (International Agency for Research on Cancer)

EC50: (Median effective concentration)

BCF: (Bio concentration Factor)

BOD: Biochemical Oxygen Demand)

NOEC: (No observed effect concentration)

NTP: (US National Toxicology Program)

RTECS: (Registry of Toxic Effects of Chemical Substances)

IATA: (International Air Transport Association)

IMDG: (International Maritime Dangerous Goods)

TDG: (Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations)

TOC: (Total Organic Carbon)

TSCA: (Toxic Substances Control Act of USA)

DSL: 9The Domestic Substances List of Canada)

NDSL: (The Non-Domestic Substances List of Canada)

