

# Safety Data Sheet

Issue Date: 18-Jan-2016

Validity Period: 01-May-2024 to  
01-May-2025

Version 3

## 1. IDENTIFICATION

### Product Identifier

Product Name Lithium Polymer Battery

### Other means of identification

SDS # GLI-003

Synonyms Li-Poly, Li-Polymer

### Recommended use of the chemical and restrictions on use

Recommended Use Battery.

### Details of the supplier of the safety data sheet

Distributor GlobTek, Inc.  
Veterans Drive , NJ 07647 : 201-784-1000

### Emergency Telephone Number

Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)  
1-800-535-5053 (North America)

## 2. HAZARDS IDENTIFICATION

**Emergency Overview Safety Data Sheets (SDS)** are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees. Because all of our batteries are defined as "articles", they are exempt from the requirements of the Hazard Communication Standard, hence an SDS is not required. However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

**Appearance** Geometric, solid object **Physical state** Solid

### Classification

The chemicals listed in section 3 are contained in a sealed container. Risk of exposure only occurs if battery is mechanically, thermally, or electrically abused.

### Other hazards

Very toxic to aquatic life with long lasting effects

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms** Li-Poly, Li-Polymer.

Chemical Composition	Molecular Formula	Weight%	CAS No	OSHA(PEL)	ACGIH(TLV)
Lithium Cobalt Oxide	LiCoO	35-38%	12190-79-3	N/A	N/A
Graphite powder	C	22-25%	7782-42-5	N/A	N/A
Electrolyte	LiPF <sub>6</sub> C <sub>3</sub> H <sub>4</sub> O <sub>3</sub> C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>	12-15%	21324-40-3	N/A	N/A
Polyethylene	(C <sub>2</sub> H <sub>4</sub> ) n	0.5-1.5%	9002-88-4	N/A	N/A
Cu	Cu	5-10%	7440-50-8	N/A	N/A
Nickel	Nickel	2-3%	7440-02-0	N/A	N/A
Polyvinylidene fluoride	(CH <sub>2</sub> CF <sub>2</sub> ) n	0.5-2%	24937-79-9	N/A	N/A
Polypropylene	(C <sub>3</sub> H <sub>6</sub> ) n	2-5%	9003-07-0	N/A	N/A
Aluminum foil	Al	7-10%	7429-90-5	N/A	N/A

\*\*If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.\*\*

### 4. FIRST-AID MEASURES

#### First Aid Measures

**General Advice** Provide this SDS to medical personnel for treatment. Following cell overheating due to external source or due to improper use, electrolyte leakage or battery container rupture may occur and release inner component/material in the environment. The materials in this battery may only represent a hazard if the integrity of the battery is compromised or if the battery is physically or electrically abused. In such a case, use the following information.

**Eye Contact** Immediately flush eyes with water for 30 minutes while lifting the upper and lower lids. Get medical attention.

**Skin Contact** Flush affected area with lukewarm water for at least 30 minutes. If skin irritation persists, call a physician.

**Inhalation** If symptoms are experienced, remove source of contamination or move victim to fresh air. Get medical attention.

**Ingestion** Do not induce vomiting. Call a physician or Poison Control Center. National battery ingestion hotline: 202-625-3333.

#### Most important symptoms and effects

**Symptoms** May cause irritation to the eyes, skin, gastrointestinal, and respiratory systems. A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.

#### Indication of any immediate medical attention and special treatment needed

**Notes to Physician** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

### Suitable Extinguishing Media

Carbon dioxide (CO<sub>2</sub>). Dry chemical.

### Unsuitable Extinguishing Media

Do not use halogenated extinguishing agents or foam. Water. Sand. Soda ash.

### Specific Hazards Arising from the Chemical

Cells may rupture when exposed to excessive heat. This could result in the release of flammable or corrosive materials. Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat or fire. Damaged or opened cells or batteries can result in rapid heating and the release of flammable vapors. Vapors may be heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back. LiPF salt contained in the electrolyte releases hydrogen fluoride in contact with water.

### Hazardous Combustion Products

Carbon monoxide. Carbon dioxide (CO<sub>2</sub>). Lithium oxides. Hydrogen fluoride. Phosphorus oxides.

### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

<b>Personal Precautions</b>	Use personal protective equipment as required. Wear protective gloves. Ventilate affected area.
<b>Other Information</b>	The material contained within the batteries is only expelled under abusive conditions.
<b>For Emergency Responders</b>	If the battery material is released, remove personnel from the area until fumes dissipate.

### Environmental precautions

<b>Environmental precautions</b>	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
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### Methods and material for containment and cleaning up

<b>Methods for Containment</b>	Prevent further leakage or spillage if safe to do so.
<b>Methods for Clean-Up</b>	Collect all released material in a plastic lined metal container. For waste disposal, see section 13 of the SDS.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

#### Advice on Safe Handling

Do not expose battery or cell to extreme temperatures or fire. Do not disassemble, crush or puncture battery. Avoid mechanical or electrical abuse. Do not short circuit. Batteries are designed to be recharged. However, improperly charging a cell or battery may cause the cell or battery to flame. Use only approved chargers and procedures. Never disassemble a battery or bypass any safety device. Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapors that may be emitted.

### Conditions for safe storage, including any incompatibilities

#### Storage Conditions

Insulate positive and negative terminals to avoid short circuit. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Protect from direct sunlight. Prevent condensation on cells or battery terminals. Elevated temperatures may result in reduced battery life. Do not store batteries above 60 °C or below -32°C. Store batteries in a cool (below 21°C/70°F), dry area that is subject to little temperature change. Elevated temperatures can result in reduced battery service life. Battery exposure to temperatures in excess of 130°C will result in the battery venting flammable liquid and gases. Do not store batteries in a manner that allows terminals to short circuit.

#### Incompatible Materials

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons. Water.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Lithium cobalt oxide 12190-79-3	TWA: 0.02 mg/m <sup>3</sup> Co		
Aluminum 7429-90-5	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 15 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 5 mg/m <sup>3</sup> Al Aluminum	TWA: 10 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable dust TWA: 5 mg/m <sup>3</sup> Al
Copper 7440-50-8	TWA: 0.2 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> Cu dust and mist	TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> dust and mist (vacated) TWA: 0.1 mg/m <sup>3</sup> Cu dust, fume, mist	IDLH: 100 mg/m <sup>3</sup> dust, fume and mist IDLH: 100 mg/m <sup>3</sup> Cu dust and mist TWA: 1 mg/m <sup>3</sup> dust and mist TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> Cu dust and mist
Nickel 7440-02-0	TWA: 1.5 mg/m <sup>3</sup> inhalable fraction	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 10 mg/m <sup>3</sup> IDLH: 10 mg/m <sup>3</sup> Ni TWA: 0.015 mg/m <sup>3</sup> TWA: 0.015 mg/m <sup>3</sup> except Nickel carbonyl Ni

### Appropriate engineering controls

**Engineering Controls** Apply technical measures to comply with the occupational exposure limits. Showers. Eyewash stations. Ventilation systems.

### Individual protection measures, such as personal protective equipment

**Eye/Face Protection** Always wear safety glasses when working with batteries and cells. Refer to 29 CFR 1910.133 for eye and face protection regulations.

**Skin and Body Protection** Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and Viton rubber gloves, Protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.

**Respiratory Protection** Not necessary under conditions of normal use. In case of battery venting or rupture, use a self contained full face respiratory mask. Refer to 29 CFR 1910.134 for respiratory protection requirements.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

Physical state	Solid	Appearance	Geometric, solid object	Odor	Not determined
Color	Not determined	Odor Threshold	Not applicable		
Property	Values	Remarks • Method			
pH	Not determined				
Melting Point/Freezing Point	NA				
Boiling Point/Boiling Range	NA				
Flash Point	None				
Evaporation Rate	NA				
Flammability (Solid, Gas)	Not determined				
Flammability Limits in Air					
Upper Flammability Limits	NA				
Lower Flammability Limit	NA				
Vapor Pressure	NA				
Vapor Density	NA				
Relative Density	NA				
Water Solubility	Not applicable				
Solubility in other solvents	Not determined				
Partition Coefficient	Not determined				
Auto-ignition Temperature	NA				
Decomposition Temperature	Not determined				
Kinematic Viscosity	Not determined				
Dynamic Viscosity	Not determined				
Explosive Properties	Not determined				
Oxidizing Properties	Not applicable				

## 10. STABILITY AND REACTIVITY

### Reactivity

Not reactive under normal conditions.

### Chemical Stability

Stable under recommended storage conditions.

### Possibility of Hazardous Reactions

None under normal processing.

### Hazardous Polymerization

Hazardous polymerization does not occur.

### Conditions to Avoid

Heat above 70°C or incinerate. Do not deform, mutilate, crush, pierce, or disassemble. Do not short circuit or expose to humid conditions.

### Incompatible Materials

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons. Water.

### Hazardous Decomposition Products

Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium hexafluorophosphate (LiPF<sub>6</sub>) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

<b>Product Information</b>	Inhalation, skin contact and eye contact are possible when the battery is opened. The following is based on exposure to internal contents
<b>Eye Contact</b>	Corrosive fumes will be very irritating to eyes.
<b>Skin Contact</b>	Contents of an open battery can cause skin irritation.
<b>Inhalation</b>	Contents of an open battery can cause respiratory irritation. Inhalation of vapors may cause irritation of the upper respiratory tract and lungs.
<b>Ingestion</b>	Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of the mouth, esophagus, and gastrointestinal tract.

### Component Information

Chemical Name	ATEmix (oral)	ATEmix (dermal)	Inhalation LC50
Carbon 7440-44-0	> 10000 mg/kg ( Rat )	-	-
Nickel 7440-02-0	> 9000 mg/kg ( Rat )	-	-

### Information on physical, chemical and toxicological effects

**Symptoms** Please see section 4 of this SDS for symptoms.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Carcinogenicity** Based on the information provided, this product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Chemical Name	ACGIH	IARC	NTP	OSHA
Lithium cobalt oxide 12190-79-3	A3	Group 2B		X
Nickel 7440-02-0		Group 2B	Known Reasonably Anticipated	X

### Legend

#### IARC (International Agency for Research on Cancer)

Group 2B - Possibly Carcinogenic to Humans

#### NTP (National Toxicology Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

#### OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

### Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document

**ATEmix (oral)** 22,522.00 mg/kg



## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Very toxic to aquatic life with long lasting effects.

### Component Information

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Copper 7440-50-8	0.0426 - 0.0535: 72 h Pseudokirchneriella subcapitata mg/L EC50 static 0.031 - 0.054: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	0.3: 96 h Cyprinus carpio mg/L LC50 semi-static 0.3: 96 h Pimephales promelas mg/L LC50 static 0.052: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.112: 96 h Poecilia reticulata mg/L LC50 flowthrough 1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.8: 96 h Cyprinus carpio mg/L LC50 static 0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.2: 96 h Pimephales promelas mg/L LC50 flow-through	0.03: 48 h Daphnia magna mg/L EC50 Static
Nickel 7440-02-0	0.18: 72 h Pseudokirchneriella subcapitata mg/L EC50 0.174 - 0.311: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	1.3: 96 h Cyprinus carpio mg/L LC50 semi-static 100: 96 h Brachydanio rerio mg/L LC50 10.4: 96 h Cyprinus carpio mg/L LC50 static	1: 48 h Daphnia magna mg/L EC50 Static 100: 48 h Daphnia magna mg/L EC50

### Persistence/Degradability

Not determined

### Bioaccumulation

Not determined.

### Mobility

Not determined

### Other Adverse Effects

Not determined

## 13. DISPOSAL CONSIDERATIONS

### Waste Treatment Methods

**Disposal of Wastes** To prevent short circuit, batteries should be completely discharged prior to disposal, terminals taped and/or capped. When completely discharged it is not considered hazardous. This product does not contain any materials listed by the United States EPA as requiring specific waste disposal requirements. These are exempted from the hazardous waste disposal standards under Universal Waste Regulations. Disposal of large quantities of Lithium Ion batteries or cells may be subject to Local, State or Federal / Provincial regulations. Consult your Local, State and Federal / Provincial regulations regarding disposal of these batteries.

**Contaminated Packaging** Disposal should be in accordance with applicable regional, national and local laws and regulations.

### US EPA Waste Number

#### Chemical Name RCRA RCRA - Basis for Listing

#### RCRA - D Series Wastes RCRA - U Series Wastes

Nickel  
7440-02-0 Included in waste streams: F006, F039

### California Hazardous Waste Status

This product contains one or more substances that are listed with the State of California as a hazardous waste

Chemical Name	California Hazardous Waste Status
Lithium cobalt oxide 12190-79-3	Toxic
Aluminum 7429-90-5	Ignitable powder
Copper 7440-50-8	Toxic
Nickel 7440-02-0	Toxic powder Ignitable powder

## 14. TRANSPORT INFORMATION

This report applies to by sea, by air and by land;

The Li-ion Battery tested according to the requirements of the 5th revised edition of the UN manual of tests and Criteria, Part III, subsection 38.3;

Lithium ion battery was protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit;

The LITHIUM ION BATTERY according to PACKING INSTRUCTION 965~967 of the 2020 IATA Dangerous Goods regulations 61st Edition may be transported and applicable U.S.DOT regulations for the safe transport of Li-ion Battery.

More information concerning shipping, testing, marking and packaging can be obtained from label master at <http://www.labelmaster.com/>.

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

The package must be handled with care and that a flammability hazard exists if the package is damaged; Each package must be labeled with a Li-ion Battery handling label or in addition to the Class 9 hazard label. With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions.
- The International Air transport Association (IATA) Dangerous Goods Regulations. UN number of lithium battery: UN3480 or UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN Classification (Transport hazard class): Non dangerous;

Marine pollutant (Y/N): N;

-The International Maritime Dangerous Goods (IMDG) Code.

For lithium-ion batteries by sea, provided that packaging is strong and prevent the products from short-circuit. UN number of lithium battery: UN3480 or UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

Special Provision: International maritime dangerous goods code (IMDG) 188, 230, 310, 348, 957;

- The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA
- The Office of Hazardous Materials Safety within the US Department of Transportations' (DOT) Research and Special Programs Administration (RSPA)

## 15. REGULATORY INFORMATION

### International Inventories

Chemical Name	TSCA	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Lithium cobalt oxide	X	X	X	Present	X	Present		X
Carbon	X	X	X		X	Present	X	X
Aluminum	X	X	X		X	Present	X	X
Copper	X	X	X		X	Present	X	X
Nickel	X	X	X		X	Present	X	X
Poly Vinylidene Fluoride	X	X		Present	X	Present	X	X

### Legend:

<b>TSCA</b>	United States Toxic Substances Control Act Section 8(b) Inventory
<b>DSL/NDSL</b>	Canadian Domestic Substances List/Non-Domestic Substances List
<b>EINECS/ELINCS</b>	European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
<b>ENCS</b>	Japan Existing and New Chemical Substances
<b>IECSC</b>	China Inventory of Existing Chemical Substances
<b>KECL</b>	Korean Existing and Evaluated Chemical Substances
<b>PICCS</b>	Philippines Inventory of Chemicals and Chemical Substances
<b>AICS</b>	Australian Inventory of Chemical Substances

## US Federal Regulations

### CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Nickel 7440-02-0	100 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ

### SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - ThresholdValues %
Lithium cobalt oxide - 12190-79-3	12190-79-3	25-50	0.1
Aluminum - 7429-90-5	7429-90-5	20-30	1.0
Copper - 7440-50-8	7440-50-8	5-15	1.0
Nickel - 7440-02-0	7440-02-0	0.5-5	0.1

### CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Copper		X	X	
Nickel		X	X	

## US State Regulations

### California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Nickel - 7440-02-0	Carcinogen

### U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Lithium cobalt oxide 12190-79-3	X		X
Aluminum 7429-90-5	X	X	X
Copper 7440-50-8	X	X	X
Nickel 7440-02-0	X	X	X

## 16. OTHER INFORMATION

<b>NFPA</b>	<b>Health Hazards</b>	<b>Flammability</b>	<b>Instability</b>	<b>Special Hazards</b>
	Not determined	Not determined	Not determined	Not determined

<b>HMIS</b>	<b>Health Hazards</b>	<b>Flammability</b>	<b>Physical hazards</b>	<b>Personal Protection</b>
	Not determined	Not determined	Not determined	Not determined

**Issue Date:** 18-Jan-2016

**Revision Date:** 01-May-2024

**Revision Note:** New product

### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**