

Safety Data Sheet

According to HCS-2012 APPENDIX D TO §1910.1200

Version: 1.0/EN

Product name: Lithium-Ion Rechargeable Battery Pack

Revision date: 5/09/2013

Printing date: 5/09/2013

1. Identification

(a) Product identifier

Product name: Lithium-Ion Rechargeable Battery Pack

Product model: L15S4A01

(b) Other means of identification

Product description: Voltage: 14.4V Ampere-hour: 2.2Ah Watt-hour: 32 Wh Content of Equivalent Li: 2.64g

(c) Recommended use of the chemical and restrictions on use

Recommended use: Used for bluetooth headset, bluetooth speakers, cell phones, MID and other portable electronic products.

Restriction on use: No information available.

(d) Details of the supplier of the product

Company name: Sanyo Electric Co., Ltd.

Address: 222-1, Kaminaizen, Sumoto City, Hyogo, Japan

Postcode: 656-8555

E-mail: joho_gijutsu@gg.jp.panasonic.com

Telephone: +81-799-24-4111

Fax: +81-799-23-2879

(e) Emergency phone number

[Weekday] +81-799-23-3931 [Night and holiday] +81-799-24-4131

2. Hazard(s) identification

(a) Classification of the chemical

The battery is considered as an article, and this product is not classified as hazardous.

(b) Label elements

Pictogram(s): No pictogram is used.

Signal word: No signal word is used.

Hazard statements: Not classified.

Precautionary statements: Not classified.

(c) Description of any hazards not otherwise classified

Do not dismantle, open or shred the battery, the ingredients contained within could be harmful.

(d) Ingredient with unknown acute toxicity

No information available.

3. Composition/information on ingredients

(a) Mixtures information: ingredients contained within the battery

Chemical name	CAS No.	Typical concentration
Aluminum	7429-90-5	5%
Cobalt lithium manganese nickel oxide	182442-95-1	35%
Copper	7440-50-8	6.5%
Dimethyl carbonate	616-38-6	8%
Ethylene carbonate	96-49-1	3%
Graphite	7782-42-5	19%
Iron	7439-89-6	16%
Lithium hexafluorophosphate	21324-40-3	2%

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Nickel	7440-02-0	0.5%
Polyethylene	9002-88-4	2%
Polyethylene terephthalate	25038-59-9	1%
Polypropylene	9003-07-0	1%
Propylene carbonate	108-32-7	1%

4. First-aid measures

(a) Description of first aid measures

Caution! No effect under routine handling and use. If exposure to internal materials within cell due to damaged outer metal casing, the following actions are recommended.

- Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if you feel unwell.
- Skin contact: Immediately flush skin with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing and shoes before reuse. Get medical aid.
- Eye contact: Rinse cautiously with water for 15-20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
- Ingestion: Rinse mouth with water. Never give anything through mouth to an unconscious person. Call a POISON Center or doctor if you feel unwell.

(b) Most important symptoms/effects, acute and delayed

No effect under routine handling and use

(c) Immediate medical attention and special treatment

Note to physicians: Treat symptomatically and supportively.

5. Fire-fighting measures

(a) Extinguishing media

Suitable extinguishing media: Use extinguishing media suitable for the materials that are burning.

Unsuitable extinguishing media: Not available.

(b) Special hazards arising from the chemical

Cell is not flammable but internal organic material will burn if the cell is incinerated.

Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

(c) Special protective equipment and precautions for fire-fighters

If possible, remove cell(s) from fire fighting area. If heated above 130°C, cell(s) may Swell /explode /vent.

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

Restrict access to area until completion of clean up. Do not touch the spilled material.

Wear adequate personal protective equipment as indicated in section 8.

(b) Methods and materials for containment and cleaning up

On Land: Place material into suitable containers and call local fire/police department.

In Water: If possible, remove from water and call local fire/police department.

7. Handling and storage

(a) Precautions for safe handling

No special protective clothing required for handling individual cells. Do not dismantle, open the battery. Do not handling the battery with metalwork. Do not open, disassemble, crush or burn battery. Ensure good

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ventilation/exhaustion at the workplace. Prevent formation of dust. Keep ignition sources away. Do not smoke.

(b) Conditions for safe storage, including any incompatibilities

Store in a cool, dry place

8. Exposure controls/personal protection

(a) Control parameters

CAS#7440-50-8

NIOSH RE: TWA 1 mg/m³ OSHA PE: TWA 1 mg/m³ The PEL also applies to other copper compounds (as Cu) except copper fume.

CAS#7429-90-5

NIOSH REL: TWA 10 mg/m³ (total); TWA 5 mg/m³ (resp)
OSHA PEL: TWA 15 mg/m³ (total); TWA 5 mg/m³ (resp)

CAS#1333-86-4

NIOSH REL: TWA 3.5 mg/m³ OSHA PEL: TWA 3.5 mg/m³

(b) Appropriate engineering controls

Keep away from heat and open flame. Store in a cool dry place.

(c) Personal protective equipment

Respiratory protection:

Not required during normal operations. SCBA required in the event of a fire.

Hand protection:

Not required for handling of cells.

Eye/face protection:

Not required beyond safety practices of employer.

Skin/body protection:

Not required for handling of cells.

9. Physical and chemical properties

(a) Appearance

Black solid

(b) Odor

Odourless

(c) Odor threshold

Not available.

(d) pH

Not available

(e) Melting point/freezing point

Not available

(f) Initial boiling point and boiling range

Not available

(g) Flash point

Not available

(h) Evaporation rate

Not available.

(i) Flammability

Not available.

(j) Upper/lower flammability or explosive limits

Not available.

(k) Vapor pressure

Not available

(l) Vapor density

Not available

(m) Density

Not available

(n) Water solubility

Not available.

(o) Partition coefficient: n-octanol/water

Not available

(p) Auto-ignition temperature

Not available.

(q) Decomposition temperature

Not available.

(r) Viscosity

Not available

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10. Stability and reactivity

(a) Reactivity

None during normal operating or handling conditions.

(b) Chemical stability

Stable under normal condition.

(c) Possibility of hazardous reactions

No hazardous reactions known.

(d) Conditions to avoid

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

(e) Incompatible materials

Strong oxidizing agents, strong acids, strong bases.

(f) Hazardous decomposition products

None during normal operating conditions.

If cells are opened, hydrogen fluoride and carbon monoxide may be released.

11. Toxicological information

(a) Information on the likely routes of exposure

- Inhalation: No effect under routine handling and use for sealed battery. If battery is broken, inhale fume/dust may cause irritation, chemical burns or lung oedema.
- Ingestion: No effect under routine handling and use for sealed battery. Harmful if swallowed the electrolyte contained inside the battery. Exposure to the electrolyte contained inside the battery may cause severe chemical burn to mouth, esophagus and gastrointestinal system.
- Skin contact: No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in chemical burns. Exposure to battery particulate may cause dermatitis.
- Eye contact: No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

(b) Information on toxicological characteristics

This product does not elicit toxicological properties during routine handling and use. If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers

Acute toxicity:	No data available.
Skin corrosion/irritation:	No data available.
Serious eye damage/irritation:	No data available.
Respiratory sensitization:	No data available.
skin sensitization:	No data available.
Carcinogenicity:	No data available.
Germ Cell Mutagenicity:	No data available.
Reproductive Toxicity:	No data available.
STOT-Single Exposure:	No data available.
STOT-Repeated Exposure:	No data available.
Aspiration Hazard:	No data available.

12. Ecological information

(a) Ecotoxicity

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No data available.

(b) Persistence and Degradability

No data available.

(c) Bioaccumulative potential

No data available.

(d) Mobility in soil

No data available.

(e) Other adverse effects

Some materials within the cell are bio-accumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

13. Disposal considerations

(a) Safe handling and methods of disposal

Dispose of according to all federal, state, and local regulations.

14. Transport information

(a) UN number	3480
(b) UN Proper shipping name	Lithium ion battery
(c) Transport hazard class(es)	Class9
(d) Packing group (if applicable)	IATA DGR 56th edition Packing Instruction 965 Section IB (Packing weight < 10kg)
(e) Marine pollutant (Yes/No)	No
(f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)	No information available.
(g) Special precautions	No information available.

15. Regulatory information

(a) Safety, health and environmental regulations specific for the product in question

CAS No.	USA TSCA	China IECSC	Canada DSL/NDSL
12190-79-3	Listed	Listed	DSL
1073-05-8	Listed	Listed	NDSL
24937-79-9	Listed	Listed	DSL
7782-42-5	Listed	Listed	DSL
7440-50-8	Listed	Listed	DSL
7429-90-5	Listed	Listed	DSL
1333-86-4	Listed	Listed	DSL

Remark: The above-mentioned search results are based on the Non-Confidential Inventory.

16. Other information, including date of preparation or last revision

(a) Preparation and revision information

Date of previous revision: Not applicable.

Date of this revision: 5/09/2013

Revision summary: The first New SDS

(b) Abbreviations and acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
OSHA:	The United States Occupational Safety and Health Administration.

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TWA: time-weighted average
STEL: Short term exposure limit
DOT: US Department Of Transportation)
IMDG: International Maritime Dangerous Goods
IATA: International Air Transport Association
TSCA: Toxic Substances Control Act, The American chemical inventory.
DSL: Domestic Substances List
IECSC: Inventory of existing chemical substances in China.

(c) Disclaimer

The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

----- End of the SDS -----

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Version: 1.0/EN

Product name: lithium ion cylindrical battery

Revision date: 07/12/2015

Printing date: 07/12/2015

1. Identification

(a) Product identifier

Product name: LGChem.
Product model: L15L4A01

(b) Other means of identification

Product description: Voltage: 14.4V
Ampere-hour: 2.8Ah
Content of Li: 2.46g

(c) Recommended use of the chemical and restrictions on use

Recommended use: - (Used for bluetooth headset, bluetooth speakers, cell phones, MID and other portable electronic products.)
Restriction on use: - (No information available.)

(d) Details of the supplier of the product

Company name: LGChem.
Address: LG Chemical Ltd. Twin Tower Youido-Dong 120, Youngdeungpo-Ku, Seoul, Korea

Postcode: 150-721
E-mail: mycho@lgchem.com
Telephone: Tel: 82-2-3773-3222

(e) Emergency phone number: 82-2-3773-7256

2. Hazard(s) identification

(a) Classification of the chemical

The battery is considered as an article, and this product is not classified as hazardous.

(b) Label elements

Pictogram(s): No pictogram is used.
Signal word: No signal word is used.
Hazard statements: Not classified.
Precautionary statements: Not classified.

(c) Description of any hazards not otherwise classified

Do not dismantle, open or shred the battery, the ingredients contained within could be harmful.

(d) Ingredient with unknown acute toxicity

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No information available.

3. Composition/information on ingredients

(a) Mixtures information: ingredients contained within the battery

Chemical name	CAS No.	Concentration range	Typical concentration
Aluminum Foil	7429-90-5	2-10%	5
Metal Oxide(proprietary)	12190-79-3	20-50%	30
Stylene-Butadiene-Rubber	9003-17-2	<1%	1
Polyvinylidene Fluoride(PVDF)	24937-79-9	<5%	5
Copper Foil	7440-50-8	2-10%	6
Carbon(proprietary)	7440-44-0	10-30%	20
Electrolyte(proprietary)	616-38-6	10-20%	15
Stainless steel, Nickel and inert materials	7440-02-0	Remainder	7

4. First-aid measures

(a) Description of first aid measures

If exposure to internal materials within cell due to damaged outer casing, the following actions are recommended.

EYE CONTACT

In case of eye contact, immediately flush eyes with plenty of water at least 15 minutes. Get medical attention if irritation persists or develops later.

INHALATION

If exposed to excessive levels of DMAc, fiber dust or fly, remove to fresh air. Get medical attention if cough or symptoms develop.

SKIN CONTACT

Wash with soap and water. Get medical attention if irritation develops or persists. Use hand creams to soothe and moisten irritated skin.

INGESTION

Not a probable route. However, in case of gastro intestinal distress following accidental ingestion, call a physician.

(b) Most important symptoms/effects, acute and delayed

No effect under routine handling and use

(c) Immediate medical attention and special treatment

Note to physicians: Treat symptomatically and supportively.

5. Fire-fighting measures

(a) Extinguishing media

Use the following extinguishing media suitable for the materials that are burning.
: Water, Carbon Dioxide, Dry Chemical, Foam

(b) Special hazards arising from the chemical

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

(c) Special protective equipment and precautions for fire-fighters

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If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) may explode /vent.
Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

Restrict access to area until completion of clean up. Do not touch the spilled material.

(b) Methods and materials for containment and cleaning up

On Land: Place material into suitable containers and call local fire/police department.
In Water: If possible, remove from water and call local fire/police department.

7. Handling and storage

(a) Precautions for safe handling

Review FIRE FIGHTING MEASURES and HANDING sections before proceeding with cleanup.
Use appropriate personal protective equipment during cleanup. Use good material handling practice

(b) Conditions for safe storage, including any incompatibilities

Store in a cool, dry place

8. Exposure controls/personal protection

(a) Control parameters

Respirator use must be in accordance with OSHA Standard 29 CFR 1910.134
Wear a correctly fitted, NIOSH approved, respirator or industrial type canister mask in enclosed areas with poor or no ventilation areas, or where TLV levels are likely to be exceeded.

(b) Appropriate engineering controls

Keep away from heat and open flame. Store in a cool dry place.

(c) Personal protective equipment

Respiratory protection:	Not required during normal operations. SCBA required in the event of a fire.
Hand protection:	Not required for handling of cells.
Eye/face protection:	Not required beyond safety practices of employer.
Skin/body protection:	Not required for handling of cells.

9. Physical and chemical properties

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State	Solid
Odor	N/A
PH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

10. Stability and reactivity

(a) Reactivity

None during normal operating or handling conditions.

(b) Chemical stability

Stable under normal condition.

(c) Possibility of hazardous reactions

No hazardous reactions known.

(d) Conditions to avoid

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

(e) Incompatible materials

Strong oxidizing agents, strong acids, strong bases.

(f) Hazardous decomposition products

None during normal operating conditions.

11. Toxicological information

(a) Information on the likely routes of exposure

Inhalation: No effect under routine handling and use for sealed battery.

Ingestion: No effect under routine handling and use for sealed battery.

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Product name: lithium ion cylindrical battery

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Skin contact: No effect under routine handling and use for sealed battery.

Eye contact: No effect under routine handling and use for sealed battery.

(b) Information on toxicological characteristics

This product does not elicit toxicological properties during routine handling and use. If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers

Acute toxicity:No data available.

Skin corrosion/irritation:No data available.

Serious eye damage/irritation:No data available.

Respiratory sensitization:No data available.

skin sensitization:No data available.

Carcinogenicity:No data available.

Germ Cell Mutagenicity:No data available.

Reproductive Toxicity:No data available.

STOT-Single Exposure:No data available.

STOT-Repeated Exposure:No data available.

Aspiration Hazard:No data available.

12. Ecological information

(a) Ecotoxicity

No ecological Information available

(b) Persistence and Degradability

No ecological Information available

(c) Bioaccumulative potential

No ecological Information available

(d) Mobility in soil

No ecological Information available

(e) Other adverse effects

No ecological Information available

13. Disposal considerations

(a) Safe handling and methods of disposal

Store in impervious inert container and send to smelter for recycling. Must be treated as special waste. In general, this product may be discarded in accordance with the State and Local regulations

14. Transport information

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Lithium Ion batteries are considered to be "Rechargeable batteries" and meet the requirements of transportation by the U.S. Department of Transportation(DOT), the International Civil Aviation Administration(ICAO), the International Maritime Dangerous Goods (IMDG) Code.

Even classified as lithium ion batteries (UN3480), 2015 IATA Dangerous Goods Regulations 56th edition Packing Instruction 965 Section IB or II is applied.

15. Regulatory information

OSHA hazard communication standard (29 CFR 1910.1200)

Hazardous Non-hazardous

16. Other information, including date of preparation or last revision

(a) Preparation and revision information

Date of previous revision: Not applicable.

Date of this revision: 13/07/2015

Revision summary: The first New SDS

(b) Abbreviations and acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
OSHA:	The United States Occupational Safety and Health Administration.
TWA:	time-weighted average
STEL:	Short term exposure limit
DOT:	US Department Of Transportation)
IMDG:	International Maritime Dangerous Goods
IATA:	International Air Transport Association
TSCA:	Toxic Substances Control Act, The American chemical inventory.
DSL	Domestic Substances List
IECSC:	Inventory of existing chemical substances in China.

(c) Disclaimer

The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS

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should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

----- End of the SDS -----

SAFETY DATA SHEET

Issuing Date No data available

Revision Date 17-Aug-2015

Revision Number 3



The supplier identified below generated this SDS using the UL SDS template. UL did not test, certify, or approve the substance described in this SDS, and all information in this SDS was provided by the supplier or was reproduced from publically available regulatory data sources. UL makes no representations or warranties regarding the completeness or accuracy of the information in this SDS and disclaims all liability in connection with the use of this information or the substance described in this SDS. The layout, appearance and format of this SDS is © 2014 UL LLC. All rights reserved.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name L15M4A01

Other means of identification

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Name SImplo Technology

Supplier Address No.471,Sec.2, Pa The Rd., Hu Kou 303, Hsin Chu Hsien, Taiwan
Hsin Chu County
Taiwan
331
TW

Supplier Phone Number Phone:+88635695920
Fax:+88635695931

Supplier Email Anderson_Hsu@simplo.com.cn

Emergency telephone number

Company Emergency Phone Number +88635695920

2. HAZARDS IDENTIFICATION

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.


Serious eye damage/eye irritation	Category 2
Skin sensitization	Category 1



Carcinogenicity

Category 2

GHS Label elements, including precautionary statements**Emergency Overview**

Signal word	Warning
Hazard Statements Causes serious eye irritation May cause an allergic skin reaction Suspected of causing cancer	
	
This product is an article which contains a chemical substance. Safety information is given for exposure to the article 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 above hazards exist.	
Appearance No information available	Physical state Solid
Odor No information available	

Precautionary Statements - Prevention

Obtain special instructions before use
 Do not handle until all safety precautions have been read and understood
 Use personal protective equipment as required
 Wash face, hands and any exposed skin thoroughly after handling
 Avoid breathing dust/fume/gas/mist/vapors/spray
 Contaminated work clothing should not be allowed out of the workplace
 Wear protective gloves
 Wear eye/face protection

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
 Specific treatment (see supplemental first aid instructions on this label)

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 If eye irritation persists: Get medical advice/attention

Skin

IF ON SKIN: Wash with plenty of soap and water
 If skin irritation or rash occurs: Get medical advice/attention
 Wash contaminated clothing before reuse

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Unknown Toxicity

45.2 % of the mixture consists of ingredient(s) of unknown toxicity

Other information

Causes mild skin irritation

Very toxic to aquatic life with long lasting effects

Repeated or prolonged skin contact may cause allergic reactions with susceptible persons

Interactions with Other Chemicals

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%	Trade Secret
Lithium Cobalt Oxide (CoLiO ₂)	12190-79-3	15 - 40	*
Copper	7440-50-8	5 - 10	*
Aluminum foil	7429-90-5	3 - 7	*
Ethylene carbonate	96-49-1	1 - 5	*
Bisphenol A - Epichlorohydrin polymer	25068-38-6	0.1 - 1	*
Nickel	7440-02-0	0.1 - 1	*

*The exact percentage (concentration) of composition has been withheld as a trade secret

4. FIRST AID MEASURES

First aid measures

General Advice

First aid is upon rupture of sealed battery.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get medical attention if irritation develops and persists.

Skin contact

Wash with soap and water. May cause an allergic skin reaction. In the case of skin irritation or allergic reactions see a physician.

Inhalation

Remove to fresh air.

Ingestion

Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.

Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects

Burning sensation. Itching. Rashes. Hives.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

May cause sensitization in susceptible persons. Treat symptomatically.



5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

Product is or contains a sensitizer. May cause sensitization by skin contact.

Uniform Fire Code

Sensitizer: Solid

Hazardous Combustion Products

Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact No.

Sensitivity to Static Discharge No.

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.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions

Avoid contact with skin, eyes or clothing. Use personal protective equipment as required.

Other Information

Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions

Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

Incompatible Products None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3	TWA: 0.02 mg/m ³	-	
Copper 7440-50-8	TWA: 0.2 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist	TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ dust and mist (vacated) TWA: 0.1 mg/m ³ Cu dust, fume, mist	IDLH: 100 mg/m ³ dust, fume and mist TWA: 1 mg/m ³ dust and mist TWA: 0.1 mg/m ³ fume
Aluminum foil 7429-90-5	TWA: 1 mg/m ³ respirable fraction	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 5 mg/m ³ Al Aluminum	TWA: 10 mg/m ³ total dust TWA: 5 mg/m ³ respirable dust
Nickel 7440-02-0	TWA: 1.5 mg/m ³	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	IDLH: 10 mg/m ³ TWA: 0.015 mg/m ³

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits NIOSH IDLH Immediately Dangerous to Life or Health

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection If splashes are likely to occur. Wear safety glasses with side shields (or goggles). None required for consumer use.

Skin and body protection Wear protective gloves and protective clothing.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Physical state	Solid	Odor	No information available
Appearance	No information available	Odor Threshold	No information available
Color	No information available		
<u>Property</u>	<u>Values</u>	<u>Remarks</u>	<u>Method</u>
pH	No data available	None known	
Melting / freezing point	No data available	None known	
Boiling point / boiling range	No data available	None known	
Flash Point	No data available	None known	
Evaporation Rate	No data available	None known	
Flammability (solid, gas)	No data available	None known	
Flammability Limit in Air			
Upper flammability limit	No data available		
Lower flammability limit	No data available		
Vapor pressure	No data available	None known	
Vapor density	No data available	None known	
Specific Gravity	No data available	None known	
Water Solubility	No data available	None known	
Solubility in other solvents	No data available	None known	
Partition coefficient: n-octanol/water	No data available	None known	
Autoignition temperature	No data available	None known	
Decomposition temperature	No data available	None known	
Kinematic viscosity	No data available	None known	
Dynamic viscosity	No data available	None known	
Explosive properties	No data available		
Oxidizing properties	No data available		
<u>Other Information</u>			
Softening Point	No data available		
VOC Content (%)	No data available		
Particle Size	No data available		
Particle Size Distribution			

10. STABILITY AND REACTIVITY

Reactivity

No data available.

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

None known based on information supplied.

Incompatible materials

None known based on information supplied.

Hazardous Decomposition Products

Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Product does not present an acute toxicity hazard based on known or supplied information. May be harmful if swallowed.

Inhalation

Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract.

Eye contact

Specific test data for the substance or mixture is not available. Causes serious eye irritation. (based on components). May cause redness, itching, and pain.

Skin contact

Specific test data for the substance or mixture is not available. May cause irritation. Prolonged contact may cause redness and irritation.

Ingestion

Specific test data for the substance or mixture is not available. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Nickel 7440-02-0	> 9000 mg/kg (Rat)	-	-

Information on toxicological effects

Symptoms

May cause redness and tearing of the eyes. Itching. Rashes. Hives.

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

Sensitization

May cause sensitization in susceptible persons. May cause sensitization by skin contact.

Mutagenic Effects

No information available.

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	A3	Group 2B		X
Nickel 7440-02-0		Group 2B	Reasonably Anticipated	X

ACGIH (American Conference of Governmental Industrial Hygienists)
 A3 - Animal Carcinogen
 IARC (International Agency for Research on Cancer)
 Group 2B - Possibly Carcinogenic to Humans
 NTP (National Toxicology Program)
 Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
 OSHA (Occupational Safety and Health Administration of the US Department of Labor)
 X - Present

- Reproductive toxicity** No information available.
- STOT - single exposure** No information available.
- STOT - repeated exposure** No information available.
- Chronic Toxicity** No known effect based on information supplied. Contains a known or suspected carcinogen.
- Target Organ Effects** Eyes. Skin. Respiratory system. Gastrointestinal tract (GI).
- Aspiration Hazard** No information available.

Numerical measures of toxicity Product Information

The following values are calculated based on chapter 3.1 of the GHS document
 Not applicable



12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Copper 7440-50-8	96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas)		48h EC50: = 0.03 mg/L
Nickel 7440-02-0	72h EC50: = 0.18 mg/L (Pseudokirchneriella subcapitata) 96h EC50: 0.174 - 0.311 mg/L (Pseudokirchneriella subcapitata)	96h LC50: > 100 mg/L (Brachydanio rerio) 96h LC50: = 1.3 mg/L (Cyprinus carpio) 96h LC50: = 10.4 mg/L (Cyprinus carpio)		48h EC50: > 100 mg/L 48h EC50: = 1 mg/L

Persistence and Degradability

No information available.

Bioaccumulation

No information available

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal methods

This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging

Dispose of contents/containers in accordance with local regulations.

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Nickel 7440-02-0	(hazardous constituent - no waste number)	Included in waste streams: F006, F039		

California Hazardous Waste Codes 141

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

Chemical Name	California Hazardous Waste
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	Toxic
Copper 7440-50-8	Toxic
Aluminum foil 7429-90-5	Ignitable powder
Nickel 7440-02-0	Toxic powder Ignitable powder

14. TRANSPORT INFORMATION

Note:

The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule)
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 "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

DOT

Proper Shipping Name NOT REGULATED
 Hazard Class NON-REGULATED
 Emergency Response Guide Number N/A
 147

TDG

Not regulated

MEX

Not regulated



ICAO	Not regulated
IATA	Not regulated
Proper Shipping Name	NON REGULATED
Hazard Class	N/A
IMDG/IMO	Not regulated
Hazard Class	N/A
EmS-No.	F-A, S-I
RID	Not regulated
ADR	Not regulated
ADN	Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL	All components are listed either on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

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 - Threshold Values %
Lithium Cobalt Oxide (CoLiO2) - 12190-79-3	12190-79-3	15 - 40	0.1
Copper - 7440-50-8	7440-50-8	5 - 10	1.0
Aluminum foil - 7429-90-5	7429-90-5	3 - 7	1.0
Nickel - 7440-02-0	7440-02-0	0.1 - 1	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

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 7440-50-8		X	X	
Nickel 7440-02-0		X	X	

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	Extremely Hazardous Substances	RQ
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		RQs	
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Aluminum foil 7429-90-5			
Nickel 7440-02-0	100 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ

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	Rhode Island	Illinois
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	X		X	X	X
Carbon 7440-44-0			X		
Ethylene carbonate 96-49-1		X	X		
Copper 7440-50-8	X	X	X	X	X
Aluminum foil 7429-90-5		X		X	
Tin 7440-31-5	X	X	X		
Nickel 7440-02-0	X	X	X	X	X

International Regulations

Mexico

National occupational exposure limits

Component	Carcinogen Status	Exposure Limits
Copper 7440-50-8 (5 - 10)		Mexico: TWA= 1 mg/m ³ Mexico: TWA= 0.2 mg/m ³ Mexico: STEL= 2 mg/m ³
Aluminum foil 7429-90-5 (3 - 7)		Mexico: TWA 10 mg/m ³
Nickel 7440-02-0 (0.1 - 1)		Mexico: TWA 1 mg/m ³

Mexico - Occupational Exposure Limits - Carcinogens

Canada

WHMIS Hazard Class

Not determined

16. OTHER INFORMATION

NFPA	Health Hazards 0	Flammability 0	Instability 0	Physical and Chemical Hazards - Personal Protection X
HMIS	Health Hazards 0	Flammability 0	Physical Hazard 0	

Prepared By Product Stewardship
23 British American Blvd.



Revision Date
Revision NoteLatham, NY 12110
1-800-572-6501
17-Aug-2015
No information available**Disclaimer**

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End of Safety Data Sheet