

LG Energy Solution LTD
Product Safety Data Sheet

LGES Lithium- Ion Rechargeable Battery Pack

SECTION 1 Product and Company Identification

PSDS Number

DPR-EF05-PSDS[SEC][SM-F936U]-V0

PRODUCT IDENTIFICATION

- Model : SM-F936U
- P/N : EB-BA936ABY L
- Structure: 1P1S Lithium- Ion Rechargeable Battery Pack
- Revision date: April 14, 2022

FURTHER INFORMATION

- Nominal Voltage : 3.88V
- Rated Capacity : Typ 2,060mAh(Min 2,005mAh)
- Wh rating : 7.99Wh(Rated : 7.77Wh)
- Weight : 26.4g

MANUFACTURING/DISTRIBUTOR

- . LG Energy Solution, Ltd. Twin Tower Youido-Dong 120, Youngdeungpo-Ku, Seoul, Korea

PHONE NUMBER

- Tel: + 82-2-3773-3169

SECTION 2 Hazards Identification

A. GHS Classification

- Skin sensitization : Category1
- Carcinogenicity : Category1B
- Specific target organ toxicity (Single exposure) : Category3(Respiratory tract irritation)
- Specific target organ toxicity (Repeated exposure) : Category2
- Acute aquatic toxicity : Category1
- Chronic aquatic toxicity : Category1

B. GHS label elements

○ **Hazard symbols**



○ **Signal words**

- Danger

○ **Hazard statements**

- H317 May cause an allergic skin reaction
- H335 May cause respiratory irritation.
- H350 May cause cancer
- H373 May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects

○ **Precautionary statements**

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P281 Use personal protective equipment as required.

2) Response

- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.

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- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P363 Wash contaminated clothing before reuse.
- P391 Collect spillage.

3) Storage

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

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ **NFPA grade (0 ~ 4 level)**

- Health : 2, Flammability : 0, Reactivity : 0

SECTION 3 Composition and Information on Ingredients

1. Lithium Ion Cell : MCP384467A10 (1ea)

Hazardous Ingredients	Content%	CAS Number
Cobalt lithium dioxide	37~47	12190-79-3
Graphite	17~27	7782-42-5
Copper	6~16	7440-50-8
Electrolyte salt	0.03~5	21324-40-3
Electrolyte (Ethylene Carbonate/Propyl propionate / Propylene Carbonate)	2~10	96-49-1 106-36-5 108-32-7
Aluminium	1~10	7429-90-5
Polyethylene	0.5~10	9002-88-4
1,1-Difluoroethene homopolymer	<5	24937-79-9
Nickel	<1	7440-02-0
1,2-Oxathiolane, 2,2-dioxide	<1	1120-71-4

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2. PCM

Manufacturer name		Powerlogics			
Manufacturer designation					
Product no					
Product name		PCM			
Function designation					
Part name	material name	Weight (g)	Q'ty	Constituent name	Constituent weight (%)
PCM	Chip IC	0.0288	2	ITM	8.07
	Chip Resistor	0.00097	6	Yageo, Rohm, SEM, Uniohm	0.27
	Chip Capacitor	0.004	2	Samhwa	1.12
	Chip Capacitor	0.00132	4	Samhwa, Murata, SEM, Taiyo-yuden	0.37
	Nickel	0.025	2	MIRAE EIC, Nadam, Powerlogic	7.0
	CREAM SOLDER	0.01	1	Alpha, SENJU	2.8
	RFPCB	0.278	1	World Top, Inno Flex	77.87
	Connector	0.0053	1	Molex, Uju	1.48
	PCM TAPE	0.0036	1	Ireh DS, 피앤티, 서광비나	1.01
Total weight					

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (ppm)
PCM	Polybrominated biphenyls(PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers(PBDEs)	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Flame Retardant type	CAS number	Weight (ppm)
PCM	Cadmium(Cd)/its compounds	7440-43-9	Not Detected
	Lead(Pb)/its compounds	7439-92-1	CHIP RESISTOR(189000) Chip Capacitor(2.17) CONNECTOR(77.5) CREAM SOLDER(245)
	Mercury(Hg)/its compounds	7439-97-5	Not Detected
	Hexavalent chromium	18540-29-9	Not Detected

Table for solder (if used in the component)

Part name	Type of solder	Composition	Amount
M705-SHF	CREAM SOLDER (Halogen-free)	Tin : 80~100% silver : 1~10 % Proprietary Resin : 1~10% Copper : 0.1~1%	0.01g

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3. Front tape

Manufacturer name		Ireh DS		
Manufacturer designation				
Product no				
Product name		Front tape		
Function designation				
Part name	Material name	Weight (g)	Constituent name	Constituent weight (%)
Front tape	PET TAPE	0.435	PET Film	93
			Adhesive	7
	INK	0.001	UV HF YELLOW	100
Total weight		0.436g		

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (g)
Front tape	Polybrominated biphenyls (PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Banned Substances	CAS number	Weight (g)
Front tape	Cadmium(Cd) / Its compounds	7440-43-9	Not Detected
	Lead(Pb) / Its compounds	7439-92-1	Not Detected
	Mercury(Hg) / Its compounds	7439-97-5	Not Detected
	Chromium(Cr6+)	18540-29-9	Not Detected

Table for Restricted Halogen Contents

Part name	Flame Retardant type	CAS number	Weight (g)
Front tape	Bromine(Br)	7726-95-6	Not Detected
	Chlorine(Cl)	7782-50-5	0.000016

Table for Restricted Plasticizers

Part name	Flame Retardant type	CAS number	Weight (g)
Front tape	PVC	9002-86-2	Not Detected

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4. Side Tape L/R

Manufacturer name		Ireh DS		
Manufacturer designation				
Product no				
Product name		Side Tape		
Function designation				
Part name	Material name	Weight (g)	Constituent name	Constituent weight (%)
Side Tape	PET Tape	0.038	PET Film	30.7
			Adhesive	63.8
			INK	5.5
Total weight	0.038g			

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (g)
Side Tape	Polybrominated biphenyls (PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Banned Substances	CAS number	Weight (g)
Side Tape	Cadmium(Cd) / Its compounds	7440-43-9	Not Detected
	Lead(Pb) / Its compounds	7439-92-1	Not Detected
	Mercury(Hg) / Its compounds	7439-97-5	Not Detected
	Chromium(Cr6+)	18540-29-9	Not Detected

Table for Restricted Halogen Contents

Part name	Flame Retardant type	CAS number	Weight (g)
Side Tape	Bromine(Br)	7726-95-6	Not Detected
	Chlorine(Cl)	7782-50-5	Not Detected

Table for Restricted Plasticizers

Part name	Flame Retardant type	CAS number	Weight (g)
Side Tape	PVC	9002-86-2	Not Detected

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5. Top Tape

Manufacturer name		Ireh DS		
Manufacturer designation				
Product no				
Product name		Top Tape		
Function designation				
Part name	Material name	Weight (g)	Constituent name	Constituent weight (%)
Top Tape	PET Tape	0.028	PET Film	29.0
			Adhesive	65.0
			INK	6.0
Total weight	0.028g			

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (g)
Top Tape	Polybrominated biphenyls (PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Banned Substances	CAS number	Weight (g)
Top Tape	Cadmium(Cd) / Its compounds	7440-43-9	Not Detected
	Lead(Pb) / Its compounds	7439-92-1	Not Detected
	Mercury(Hg) / Its compounds	7439-97-5	Not Detected
	Chromium(Cr6+)	18540-29-9	Not Detected

Table for Restricted Halogen Contents

Part name	Flame Retardant type	CAS number	Weight (g)
Top Tape	Bromine(Br)	7726-95-6	Not Detected
	Chlorine(Cl)	7782-50-5	Not Detected

Table for Restricted Plasticizers

Part name	Flame Retardant type	CAS number	Weight (g)
Top Tape	PVC	9002-86-2	Not Detected

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6. Poron Tape

Manufacturer name		Ireh DS		
Manufacturer designation				
Product no				
Product name		Poron Tape		
Function designation				
Part name	Material name	Weight (g)	Constituent name	Constituent weight (%)
Poron Tape	Poron Tape	0.0334	Pu Foam	70
			Adhesive	30
Total weight	0.0334			

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (g)
Poron Tape	Polybrominated biphenyls (PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Banned Substances	CAS number	Weight (g)
Poron Tape	Cadmium(Cd) / Its compounds	7440-43-9	Not Detected
	Lead(Pb) / Its compounds	7439-92-1	Not Detected
	Mercury(Hg) / Its compounds	7439-97-5	Not Detected
	Chromium(Cr6+)	18540-29-9	Not Detected

Table for Restricted Halogen Contents

Part name	Flame Retardant type	CAS number	Weight (g)
Poron Tape	Bromine(Br)	7726-95-6	Not Detected
	Chlorine(Cl)	7782-50-5	Not Detected

Table for Restricted Plasticizers

Part name	Flame Retardant type	CAS number	Weight (g)
Poron Tape	PVC	9002-86-2	Not Detected

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7. Printing

Manufacturer name		Daeyoung tech / Domino		
Manufacturer designation				
Product no				
Product name		Pad Printing / Ink Printing		
Function designation				
Part name	Material name	Weight (g)	Constituent name	Constituent weight (%)
Printing	Pad Printing	0.002	UV HF BLACK INK	100
	Ink Printing	0.001	PRINTING INK	70
			MAKE UP INK	30
Total weight	0.03			

Table for Banned Brominated Flame Retardants

Part name	Flame Retardant type	CAS number	Weight (g)
Printing	Polybrominated biphenyls (PBBs)	59080-40-9	Not Detected
	Polybrominated diphenyl ethers	101-55-3	Not Detected

Table for Banned Metals and Their Compounds

Part name	Banned Substances	CAS number	Weight (g)
Printing	Cadmium(Cd) / Its compounds	7440-43-9	Not Detected
	Lead(Pb) / Its compounds	7439-92-1	Not Detected
	Mercury(Hg) / Its compounds	7439-97-5	Not Detected
	Chromium(Cr6+)	18540-29-9	Not Detected

Table for Restricted Halogen Contents

Part name	Flame Retardant type	CAS number	Weight (g)
Printing	Bromine(Br)	7726-95-6	Not Detected
	Chlorine(Cl)	7782-50-5	0.000096

Table for Restricted Plasticizers

Part name	Flame Retardant type	CAS number	Weight (g)
Printing	PVC	9002-86-2	Not Detected

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SECTION 4 First Aid Measures

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Get medical attention immediately.

B. Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contaminated clothing, shoes and isolate.
- Wash thoroughly after handling.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

D. Ingestion contact

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.

SECTION 5 Fire Fighting Measures

A. Suitable (Unsuitable) extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

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C. Special protective actions for firefighters

- Move containers from fire area, if you can do without the risk.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local fire station and inform the location of the fire and characteristics hazard.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Keep containers cool with water spray.

SECTION 6 Accidental Release Measures

A. Personal precautions, protective equipment and emergency procedures

- Ventilate closed spaces before entering.
- Move container to safe area from the leak area.
- Remove all sources of ignition.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away, isolate hazard area and deny entry.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Avoid entering to sewers or water system.
- Prevent the influx to waterways, sewers, basements or confined spaces.
- Spilled material should be treated as a potential risk of waste collected.

SECTION 7 Handling and Storage

A. Precautions for safe handling

- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Do not handle until all safety precautions have been read and understood.

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- Operators should wear antistatic footwear and clothing.
- Contaminated work clothing should not be allowed out of the workplace.

B. Conditions for safe storage, including any incompatibilities

- Store in cool, dry and well ventilated place.
- Do not use damaged containers.
- Store according to current laws and regulations
- Please pay attention to incompatibilities materials and conditions to avoid.
- Keep sealed when not in use.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.
- Store away from water and sewer.

SECTION 8 Exposure Controls / Personal Protection

A. Exposure limits

- **ACGIH TLV**
 - [Graphite] : TWA, 2 mg/m³, Respirable particulate mass
 - [Copper] : TWA, 0.2 mg/m³ (Fume, as Cu), TWA, 1 mg/m³ (Dusts and Mists, as Cu)
 - [Aluminium] : TWA, 1 mg/m³, Respirable Particulate Matter
 - [Nickel] : TWA, 1.5 mg/m³, Inhalable nickel particulate mass-Elemental/Metal, TWA, 0.1 mg/m³, Inhalable nickel particulate mass-Soluble compounds, TWA, 0.2 mg/m³, Inhalable nickel particulate mass-Insoluble compounds
- **OSHA PEL**
 - [Aluminium]: 15 mg/m³ (Total dust), 5 mg/m³ (Respirable fraction)
 - [Graphite]: 15 mppcf (Graphite, Natural)/15 mg/m³ (Total dust), 5 mg/m³ (Respirable fraction)(Graphite, synthetic)
 - [Nickel]: 1mg/m³
 - [Copper]: 0.1 mg/m³ (Fume), 1 mg/m³ (Dusts and mists)

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

C. Individual protection measures, such as personal protective equipment

- **Respiratory protection**
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
- **Eye protection**
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- **Hand protection**
 - Wear appropriate glove.
- **Skin protection**
 - Wear appropriate clothing.

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- **Others**
 - Not available

SECTION 9 Physical and Chemical Properties

A. Appearance	
- Appearance	Liquid / solid mixture
- Color	Not available
B. Odor	Not available
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	Not available
F. Initial Boiling Point/Boiling Ranges	Not available
G. Flash point	Not available
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	Not available
L. Solubility	Not available
M. Vapour density	Not available
N. Specific gravity(Relative density)	Not available
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	Not available
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	Not available

SECTION 10 Stability and Reactivity

A. Chemical Stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

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C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire

SECTION 11 Toxicological Information

A. Information on the likely routes of exposure

- **(Respiratory tracts)**
 - May cause respiratory irritation.
- **(Oral)**
 - Not available
- **(Eye/Skin)**
 - May cause an allergic skin reaction

B. Delayed and immediate effects and also chronic effects from short and long term exposure

- **Acute toxicity**
 - * Oral
 - Product (ATEmix) : 2000mg/kg < ATEmix <= 5000mg/kg
 - [Cobalt lithium dioxide] : LD50 > 5000 mg/kg Rat (OECD Guideline 425, GLP)
 - [Graphite] : LD50 >2000 mg/kg Rat (OECD Guideline 423 ,GLP)
 - [Copper] : LD50 481 mg/kg Rat (OECD TG 401, GLP)
 - [Aluminium] : LD50 > 15900 mg/kg Rat (OECD TG 401)
 - [Polyethylene] : LD50 > 8000 mg/kg Rat (RTECS)
 - [Secret] : LD50 > 8000 mg/kg Rat
 - [Nickel] : LD50 >9000 mg/kg Rat (ECETOC TR No. 33 (1989))
 - [1,2-Oxathiolane, 2,2-dioxide] : LD50 157 mg/kg Rat
 - * Dermal
 - Product (ATEmix) : 2000mg/kg < ATEmix <= 5000mg/kg
 - [Cobalt lithium dioxide] : LD50 > 2000 mg/kg Rabbit (OECD Guideline 402, Read-across based on CAS No. 1308-06-1)
 - [Copper] : LD50 > 2000 mg/kg Rat (OECD TG 402, GLP)
 - [1,2-Oxathiolane, 2,2-dioxide] : LD50 660 mg/kg Rabbit
 - * Inhalation
 - Product (ATEmix) : Not available
 - [Graphite] : Dust LC50 > 2 mg/ℓ 4 hr Rat (OECD Guideline 403, GLP)

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- [Copper] : LC50 > 5.11 mg/ℓ 4 hr Rat (OECD TG 436, GLP)
- [Aluminium] : Dust LC50 > 0.888 mg/ℓ 4 hr Rat (OECD TG 403, GLP)
- [Polyethylene] : dust LC50 = 9.44 mg/L 4hr (75.5 mg/ℓ 30 min) Rat (RTECS)
- [Nickel] : Dust LC50 10200 mg/kg
- **Skin corrosion/irritation**
 - Not available
- **Serious eye damage/irritation**
 - Not available
- **Respiratory sensitization**
 - Not available
- **Skin sensitization**
 - May cause an allergic skin reaction
- **Carcinogenicity**
 - * IARC
 - [Polyethylene] : Group 3
 - [Nickel] : Group 2B (Nickel refinery dust)
 - [Nickel] : Group 1 (Nickel, metallic and alloys)
 - [Nickel] : Group 1 (Nickel compounds)
 - [Nickel] : Group 1 (Nickel, insoluble inorganic compounds)
 - [Nickel] : Group 1 (Nickel, soluble inorganic compounds)
 - [1,2-Oxathiolane, 2,2-dioxide] : Group 2A(in prep)
 - [Secret] : Group 3
 - * OSHA
 - Not available
 - * ACGIH
 - [Aluminium] : A4 (Aluminum metal and insoluble compounds)
 - [Nickel] : A5 (Nickel refinery dust)
 - [Nickel] : A5 (Nickel, metallic and alloys)
 - [Nickel] : A5 (Nickel compounds)
 - [Nickel] : A5 (Nickel, insoluble inorganic compounds)
 - [Nickel] : A5 (Nickel, soluble inorganic compounds)
 - [1,2-Oxathiolane, 2,2-dioxide] : A3
 - * NTP
 - [Nickel] : K (Nickel refinery dust)
 - [Nickel] : K (Nickel, metallic and alloys)
 - [Nickel] : K (Nickel compounds)
 - [Nickel] : K (Nickel, insoluble inorganic compounds)
 - [Nickel] : K (Nickel, soluble inorganic compounds)
 - [1,2-Oxathiolane, 2,2-dioxide] : R
 - * EU CLP
 - [Nickel] : Carc. 2 (Nickel refinery dust)
 - [Nickel] : Carc. 2 (Nickel, metallic and alloys)
 - [Nickel] : Carc.2 (Nickel, metallic and alloys)
 - [Nickel] : Carc. 2 (Nickel compounds)
 - [Nickel] : Carc. 2 (Nickel, insoluble inorganic compounds)
 - [Nickel] : Carc. 2 (Nickel, soluble inorganic compounds)
 - [1,2-Oxathiolane, 2,2-dioxide] : Carc.1B

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- **Germ cell mutagenicity**
 - Not available
- **Reproductive toxicity**
 - Not available
- **STOT-single exposure**
 - May cause respiratory irritation.
- **STOT-repeated exposure**
 - May cause damage to organs through prolonged or repeated exposure (Refer Section SDS 11)
- **Aspiration hazard**
 - Not available

SECTION 12 Ecological Information

A. Ecotoxicity

- **Fish**
 - [Cobalt lithium dioxide] : LC50 1.406 mg/ℓ 96 hr Oncorhynchus mykiss (Read-across based on CAS No. 7646-79-9) (ECHA)
 - [Graphite] : LC50 > 100 mg/ℓ 96 hr (Danio rerio (OECD Guideline 203, GLP)
 - [Copper] : LC50 0.286 mg/ℓ 96 hr Oncorhynchus mykiss (LC50 0.28640% sewage treatment plant effluent, 0.164river water mg/ℓ 96hr)
 - [Nickel] : (NOEC/LC10 = 40 - 1,100 µg Ni L-1 Oncorhynchus mykiss)
- **Crustaceans**
 - [Cobalt lithium dioxide] : EC50 > 1.93 mg/ℓ 48 hr Ceriodaphnia dubia (Read-across based on CAS No. 7646-79-9) (ECHA)
 - [Graphite] : EC50 > 100 mg/ℓ 48 hr Daphnia magna (OECD Guideline 202 ,GLP)
 - [Copper] : LC50 0.0338 mg/ℓ ~ 0.792 mg/ℓ 48 hr Daphnia magna (OECD TG 202)
 - [Aluminium] : IUCLID NOEC > 100 mg/ℓ 48 hr Daphnia magna
- **Algae**
 - [Cobalt lithium dioxide] : ErC50 71.314 mg/ℓ 96 hr (Algae Test species Dunaliella tertiolecta, Read-across based on CAS No. 7646-79-9) (ECHA)
 - [Graphite] : ErC50 > 100 mg/ℓ 72 hr (Pseudokirchnerella subcapitata, (OECD Guideline 201, GLP)
 - [Copper] : NOEC 0.708 mg/ℓ ~ 0.0376 mg/ℓ 72 hr (Phaeodactylum tricorutum: NOEC = 0.0376 - 0.708 mg/ℓ 72hr, OECD TG 201Phaeodactylum tricorutum: NOEC = 5.7 µg/ℓ, IOS 10253, GLP)
 - [Aluminium] : NOEC ≥ 0.052 mg/ℓ 72 hr Selenastrum capricornutum (OECD TG 201, GLP)
 - [Nickel] : (88.2 µg Ni L-1 Pseudokirchneriella subcapitata)

B. Persistence and degradability

- **Persistence**
 - [Cobalt lithium dioxide] : log Kow -1.73 (EPI Suite)
 - [Copper] : log Kow = -0.57 (Estimate)
- **Degradability**
 - Not available

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C. Bioaccumulative potential

- **Bioaccumulative potential**
 - [Cobalt lithium dioxide] : BCF 5500 (Read-across based on CAS No. 7646-79-9)
 - [Copper] : BCF = 5830
- **Biodegradation**
 - Not available

D. Mobility in soil

- Not available

E. Other adverse effects

- Not available

SECTION 13 Disposal Considerations

A. Disposal methods

- Since more than two kinds of designated waste is mixed, it is difficult to treat separately, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal

- The user of this product must dispose by oneself or entrust it to a waste disposer, a person who recycles other's waste or establishes and operates waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

SECTION 14 Transport Information

A. UN No. (IMDG)

- 3480

B. Proper shipping name

- LITHIUM ION BATTERIES (including lithium ion polymer batteries)

C. Hazard Class

- 9

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D. IMDG Packing group

- II

E. Marine pollutant

- Applicable
- Applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- Air transport(IATA): Not subject to IATA regulations.
- EmS FIRE SCHEDULE : F-A (General fire schedule)
- EmS SPILLAGE SCHEDULE : S-I (Flammable solids (repacking possible))

SECTION 15 Regulatory Information

A. National and/or international regulatory information

- **POPs Management Law**
 - Not applicable
- **Information of EU Classification**
 - * Classification
 - [Aluminium] : H261,H250
 - [Aluminium] : H261,H228
 - [1,2-Oxathiolane, 2,2-dioxide] : H350,H312,H302
 - [Nickel] : H351,H372,H317
 - [Nickel] : H351,H372,H317,H412
- **U.S. Federal regulations**
 - * OSHA PROCESS SAFETY (29CFR1910.119)
 - Not applicable
 - * CERCLA Section 103 (40CFR302.4)
 - [Copper] : 2267.995 kg 5000 lb
 - [Nickel] : 45.3599 kg 100 lb
 - [1,2-Oxathiolane, 2,2-dioxide] : 4.53599 kg 10 lb
 - * EPCRA Section 302 (40CFR355.30)
 - Not applicable
 - * EPCRA Section 304 (40CFR355.40)
 - Not applicable
 - * EPCRA Section 313 (40CFR372.65)
 - [Copper] : Applicable
 - [Aluminium] : Applicable
 - [Nickel] : Applicable
 - [1,2-Oxathiolane, 2,2-dioxide] : Applicable

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- **Rotterdam Convention listed ingredients**
 - Not applicable
- **Stockholm Convention listed ingredients**
 - Not applicable
- **Montreal Protocol listed ingredients**
 - Not applicable

SECTION 16 Other Information

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources:
KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2022-04-14

C. Revision number and Last date revised

- 2022-04-14 (Rev.0)

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).