

# SwitchPack

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations  
Date of Issue: 04/12/2023

Version: 1.0

### SECTION 1: IDENTIFICATION

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** SwitchPack

**Product Code:** MS-109205-C

**Additional Information:** This product is a sealed battery. The battery contains hazardous substances, which under normal conditions of use are not in contact with the user unless the battery is altered or there is a spill, leak, or other emergency. This Safety Data Sheet applies to the hazards of the internal contents of the battery, specifically the hazardous substances encased within it.

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Secondary Lithium-Ion Battery Pack containing 14 Lithium-ion, SLPB120216216HR2A cells. Full Capacity Rating @ 1C rate: 2100Wh (83Ah).

#### 1.3. Name, Address, and Telephone of the Responsible Party

Stryten Energy LLC

5925 Cabot Pkwy

Alpharetta, GA

30005

678-566-9000

#### 1.4. Emergency Telephone Number

**Emergency Number** : VelocityEHS  
(800)255-3924 (North America)  
+1 (813)248-0585 (International)

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

##### GHS-US Classification

Acute toxicity (oral) Category 3	H301
Acute toxicity (inhalation:dust,mist) Category 2	H330
Skin corrosion/irritation Category 1A	H314
Serious eye damage/eye irritation Category 1	H318
Carcinogenicity Category 1B	H350
Specific target organ toxicity (repeated exposure) Category 1	H372
Hazardous to the aquatic environment - Acute Hazard Category 1	H400
Hazardous to the aquatic environment - Chronic Hazard Category 2	H411

#### 2.2. Label Elements

##### GHS-US Labeling

**Hazard Pictograms (GHS-US)**



**Signal Word (GHS-US)**

: Danger

**Hazard Statements (GHS-US)**

: H301 - Toxic if swallowed.  
H314 - Causes severe skin burns and eye damage.  
H318 - Causes serious eye damage.  
H330 - Fatal if inhaled.  
H350 - May cause cancer (inhalation).  
H372 - Causes damage to organs (teeth, bones, CNS, lungs) through prolonged or repeated exposure.  
H400 - Very toxic to aquatic life.  
H411 - Toxic to aquatic life with long lasting effects.

**Precautionary Statements (GHS-US)**

: P201 - Obtain special instructions before use.  
P202 - Do not handle until all safety precautions have been read and understood.  
P260 - Do not breathe fume, vapors, dust.  
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.  
P270 - Do not eat, drink or smoke when using this product.  
P271 - Use only outdoors or in a well-ventilated area.

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P273 - Avoid release to the environment.  
P280 - Wear protective gloves, protective clothing, and eye protection.  
P284 - [In case of inadequate ventilation] wear respiratory protection.  
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting.  
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.  
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308+P313 - If exposed or concerned: Get medical advice/attention.  
P310 - Immediately call a poison center or doctor.  
P314 - Get medical advice/attention if you feel unwell.  
P320 - Specific treatment is urgent (see section 4 on this SDS).  
P330 - Rinse mouth.  
P363 - Wash contaminated clothing before reuse.  
P391 - Collect spillage.  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.  
P405 - Store locked up.  
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

### 2.3. Other Hazards

Exposure to the internal contents may aggravate pre-existing eye, skin, or respiratory conditions. Substances within this product may be reactive with water or air, and are flammable if released. Thermal decomposition of this product may generate corrosive, and toxic vapors.

### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Synonyms	Product Identifier	%	GHS US classification
Cobalt lithium manganese nickel oxide	Lithium cobalt manganese nickel oxide / Cobalt lithium manganese nickel oxide (1:?:?:?)	(CAS-No.) 182442-95-1	20 – 50	Acute Tox. 2 (Inhalation), H330 Carc. 1B, H350 STOT RE 1, H372 Aquatic Chronic 3, H412
Graphite	C.I. Pigment Black 10 / C.I. 77265 / graphite	(CAS-No.) 7782-42-5	15 – 35	Comb. Dust
1,3-Dioxolan-2-one	Ethylene carbonate / Carbonic acid, cyclic ethylene ester / Cyclic ethylene carbonate / Ethylene glycol carbonate / Glycol carbonate / ETHYLENE CARBONATE / 2-Oxo-1,3-dioxolan / 2-Dioxolanone	(CAS-No.) 96-49-1	10 – 20	Acute Tox. 4 (Oral), H302 Eye Irrit. 2A, H319 STOT RE 2, H373
Carbonate, methyl ethyl	Carbonic acid, ethyl methyl ester / ethyl methyl carbonate / Ethyl methyl carbonate	(CAS-No.) 623-53-0	10 – 20	Flam. Liq. 2, H225
Phosphate(1-), hexafluoro-, lithium	Lithium hexafluorophosphate(1-) / Lithium phosphohexafluoride / Phosphate(1-), hexafluoro-, lithium (1:1) / Lithium hexafluorophosphate	(CAS-No.) 21324-40-3	10 – 20	Acute Tox. 3 (Oral), H301 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT RE 1, H372
Copper	Copper, metallic / Pigment Metal 2 / Copper metal / CI 77400 / Copper, elemental / C.I. Pigment Metal 2 / C.I. 77400 / Granulated copper / copper	(CAS-No.) 7440-50-8	3 – 12	Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Comb. Dust

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Aluminum	Aluminium / Aluminium metal / Aluminium, metal / Aluminum metal / Aluminum, elemental / Aluminum, metal / C.I. 77000 / CI 77000 / Aluminium powder (stabilised) / Aluminium powder (stabilized) / Aluminium powder / Pigment Metal 1 / Aluminum powder / Aluminium metal, powder / aluminum	(CAS-No.) 7429-90-5	3 – 12	Comb. Dust
1,1-Difluoroethylene polymer	Ethene, 1,1-difluoro-, homopolymer / Homopolymer, ethene, 1,1-difluoro- / Polyvinylidene fluoride / Polyvinylidene fluoride resin / Poly(vinylidene fluoride) / Poly(1,1-difluoroethene) / POLYVINYLIDENE DIFLUORIDE / Vinylidene fluoride homopolymer / Polymer of 1,1-difluoroethene	(CAS-No.) 24937-79-9	< 8	Comb. Dust
Phosphoric acid, iron(2+) lithium salt (1:1:1)	Ferrous lithium phosphate / Lithium iron(II) phosphate / LiFePO <sub>4</sub> / Iron Lithium Phosphate / Iron(II) lithium phosphate	(CAS-No.) 15365-14-7	< 1	Not classified
Titanium dioxide	C.I. 77891 / C.I. Pigment White 6 / Titanium oxide (TiO <sub>2</sub> ) / CI 77891 / Titanium(IV) oxide / C.I. Pigment White 7 / Pigment White 6 / Titanium dioxide nanoparticles / Titanium oxide	(CAS-No.) 13463-67-7	< 1	Carc. 2, H351
Lithium titanium oxide	Tetralithium pentatitanium dodecaoxide / Tetralithium pentatitanium oxide (Li <sub>4</sub> Ti <sub>5</sub> O <sub>12</sub> )	(CAS-No.) 12031-95-7	< 1	Not classified

Full text of H-phrases: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of First-aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** For exposure to battery contents: First, take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.

**First-aid Measures After Skin Contact:** For exposure to battery contents: Immediately remove contaminated clothing. Immediately flush skin with plenty of water for at least 30 minutes. Get immediate medical advice/attention.

**First-aid Measures After Eye Contact:** For exposure to battery contents: Immediately rinse with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

**First-aid Measures After Ingestion:** For exposure to battery contents: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor. Obtain emergency medical attention.

### 4.2. Most Important Symptoms and Effects Both Acute and Delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use. Exposure to battery contents may result in the following: May cause cancer (inhalation). Causes damage to organs (teeth, bones, CNS, lungs) through prolonged or repeated exposure. Toxic if swallowed. Causes severe skin burns and eye damage. Fatal if inhaled.

**Symptoms/Injuries After Inhalation:** Exposure to materials housed in battery: May be corrosive to the respiratory tract. Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death.

**Symptoms/Injuries After Skin Contact:** Exposure to materials housed in battery: Causes severe irritation which will progress to chemical burns.

**Symptoms/Injuries After Eye Contact:** Exposure to materials housed in battery: Causes permanent damage to the cornea, iris, or conjunctiva.

**Symptoms/Injuries After Ingestion:** Exposure to materials housed in battery: This material is toxic in small amounts orally, and can cause adverse health effects or death. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

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**Chronic Symptoms:** Exposure to materials housed in battery: Causes damage to organs (teeth, bones, CNS, lungs) through prolonged or repeated exposure. May cause cancer (inhalation).

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Fog, carbon dioxide (CO<sub>2</sub>), alcohol-resistant foam, or dry chemical. Move undamaged containers away from the area around the fire, if it can be done safely.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire. Do NOT use water on live electrical circuits. Application of water to product may generate heat and increase fire intensity.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Vapors from a damaged battery may be flammable.

**Explosion Hazard:** Battery may rupture/explode when exposed to excessive heat or fire, if overcharged, short circuited, punctured, or crushed.

**Reactivity:** Batteries are non-reactive under normal conditions of storage and use. If the internal contents are leaked lithium ion batteries may react with incompatible materials such as water, acids, bases, oxidizers, and reducing agents and form corrosive, irritating, and harmful fumes and by-products.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers. Remove containers from fire area if this can be done without risk. Do not breathe fumes from fires or vapours from decomposition.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>). Hydrogen Fluoride (HF). Metal oxides. Phosphorous oxide.

**Other Information:** Do not allow run-off from fire fighting to enter drains or water courses. Batteries may explode in fire. Damaged batteries can result in rapid heating and the release of flammable vapors.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Product itself under normal conditions of use is not considered hazardous, for materials housed within product: Do not get in eyes, on skin, or on clothing. Do not breathe dust, vapors, spray from inner battery components. Avoid short circuits.

#### 6.1.1. For Non-Emergency Personnel

**Protective Equipment:** Use appropriate personal protective equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Personnel

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

### 6.3. Methods and Materials for Containment and Cleaning Up

**For Containment:** Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions. Ventilate area.

**Methods for Cleaning Up:** If battery is not damaged, cleanup spills mechanically and put into approved container for disposal. If battery is damaged and/or leaking: Clean up spills immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Cautiously neutralize spilled solid.

### 6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed:** May release corrosive vapors. Never disassemble a battery or bypass any safety device. Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods. Do not directly heat or solder. Do not throw into fire. Do not mix batteries of different types and brands.

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**Precautions for Safe Handling:** Since this product is a sealed battery, normal handling hazards are minimal unless the battery is damaged or the internal contents are exposed. If the battery is damaged: Use appropriate personal protective equipment (PPE). Obtain special instructions before use. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes, skin and clothing. Use only outdoors or in a well-ventilated area. Do not breathe dust, vapors, spray from inner battery components. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Handle empty containers with care because they may still present a hazard.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations. Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.

**Storage Conditions:** Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store locked up/in a secure area.

**Incompatible Materials:** For exposure to the internal contents of the battery: Oxidizers, water, acids and bases.

**Storage Temperature:** Do not exposure to high temperatures

### 7.3. Specific End Use(s)

Secondary Lithium-Ion Battery Pack containing 14 Lithium-ion, SLPB120216216HR2A cells. Full Capacity Rating @ 1C rate: 2100Wh (83Ah).

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), or OSHA (PEL).

Titanium dioxide (13463-67-7)		
USA ACGIH	ACGIH OEL TWA	10 mg/m <sup>3</sup>
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA)	2.4 mg/m <sup>3</sup> (CIB 63-fine) 0.3 mg/m <sup>3</sup> (CIB 63-ultrafine, including engineered nanoscale)
USA IDLH	IDLH	5000 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) [1]	15 mg/m <sup>3</sup> (total dust)
Graphite (7782-42-5)		
USA ACGIH	ACGIH OEL TWA	2 mg/m <sup>3</sup> (all forms except graphite fibers-respirable particulate matter)
USA NIOSH	NIOSH REL (TWA)	2.5 mg/m <sup>3</sup> (natural-respirable dust)
USA IDLH	IDLH	1250 mg/m <sup>3</sup> (Graphite (natural))
USA OSHA	OSHA PEL (TWA) [1]	15 mg/m <sup>3</sup> (synthetic-total dust) 5 mg/m <sup>3</sup> (synthetic-respirable fraction)
USA OSHA	OSHA PEL (TWA) [2]	15 mppcf (natural) (See 29 CFR 1910.1000 TABLE Z-3)
Copper (7440-50-8)		
USA ACGIH	ACGIH OEL TWA	0.2 mg/m <sup>3</sup> (fume)
USA NIOSH	NIOSH REL (TWA)	1 mg/m <sup>3</sup> (dust and mist) 0.1 mg/m <sup>3</sup> (fume)
USA IDLH	IDLH	100 mg/m <sup>3</sup> (dust, fume and mist)
USA OSHA	OSHA PEL (TWA) [1]	0.1 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
Aluminum (7429-90-5)		
USA ACGIH	ACGIH OEL TWA	1 mg/m <sup>3</sup> (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA)	10 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)
USA OSHA	OSHA PEL (TWA) [1]	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable fraction)

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### 8.2. Exposure Controls

#### Appropriate Engineering Controls

: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released.

#### Personal Protective Equipment

: Not required under normal conditions of use. When handling damaged batteries: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection. Face shield.



#### Materials for Protective Clothing

: Not required under normal conditions of use. When handling damaged batteries: Chemically resistant materials and fabrics. Corrosion-proof clothing.

#### Hand Protection

: Not required under normal conditions of use. When handling damaged batteries: Wear protective gloves.

#### Eye and Face Protection

: Not required under normal conditions of use. When handling damaged batteries: Chemical safety goggles and face shield.

#### Skin and Body Protection

: Not required under normal conditions of use. When handling damaged batteries: Wear suitable protective clothing.

#### Respiratory Protection

: Not required under normal conditions of use. When handling damaged batteries: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

#### Other Information

: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: No data available
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: No data available
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: No data available
Relative Vapor Density at 20°C	: No data available
Relative Density	: No data available
Solubility	: No data available
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: No data available

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Batteries are non-reactive under normal conditions of storage and use. If the internal contents are leaked lithium ion batteries may react with incompatible materials such as water, acids, bases, oxidizers, and reducing agents and form corrosive, irritating, and harmful fumes and by-products.

### 10.2. Chemical Stability

Stable under recommended handling and storage conditions (see section 7).

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### 10.3. Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

### 10.4. Conditions to Avoid

Direct sunlight, extremely high or low temperatures, and incompatible materials. Do not heat, expose to fire, disassemble, short circuit, immerse in water, or overcharge batteries.

### 10.5. Incompatible Materials

For exposure to the internal contents of the battery: Oxidizers, water, acids and bases.

### 10.6. Hazardous Decomposition Products

None expected under normal conditions of use.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on Toxicological Effects

**Acute Toxicity (Oral):** Toxic if swallowed.

**Acute Toxicity (Dermal):** Not classified

**Acute Toxicity (Inhalation):** Fatal if inhaled.

<b>SwitchPack</b>	
ATE (Oral)	227.27 mg/kg body weight
ATE (Dust/Mist)	0.10 mg/l/4h
<b>Cobalt lithium manganese nickel oxide (182442-95-1)</b>	
ATE (Gases)	100.00 ppmV/4h
ATE (Vapors)	0.50 mg/l/4h
ATE (Dust/Mist)	0.05 mg/l/4h
<b>Phosphoric acid, iron(2+) lithium salt (1:1:1) (15365-14-7)</b>	
LD50 Dermal Rat	> 2000 mg/kg
<b>Titanium dioxide (13463-67-7)</b>	
LD50 Oral Rat	> 10000 mg/kg
LC50 Inhalation Rat	5.09 mg/l/4h
<b>Graphite (7782-42-5)</b>	
LD50 Oral Rat	> 2000 mg/kg
LC50 Inhalation Rat	> 2000 mg/m <sup>3</sup> (Exposure time: 4 h)
<b>Lithium titanium oxide (12031-95-7)</b>	
LD50 Oral Rat	> 2000 mg/kg
LC50 Inhalation Rat	> 5.04 mg/l/4h
<b>Copper (7440-50-8)</b>	
LC50 Inhalation Rat	> 5.11 mg/l/4h
<b>1,3-Dioxolan-2-one (96-49-1)</b>	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 26420 mg/kg
LC50 Inhalation Rat	> 730 mg/m <sup>3</sup> (Exposure time: 8 h)
ATE (Oral)	500.00 mg/kg body weight
<b>Carbonate, methyl ethyl (623-53-0)</b>	
LD50 Oral Rat	> 15000 mg/kg
LC50 Inhalation Rat	> 17.6 mg/l/4h
<b>Phosphate(1-), hexafluoro-, lithium (21324-40-3)</b>	
LD50 Oral Rat	50 – 300 mg/kg
<b>Aluminum (7429-90-5)</b>	
LC50 Inhalation Rat	> 0.888 mg/L/4h (No deaths)

**Skin Corrosion/Irritation:** Causes severe skin burns.

**Serious Eye Damage/Irritation:** Causes serious eye damage.

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** May cause cancer.

<b>Titanium dioxide (13463-67-7)</b>	
IARC group	2B

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**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Causes damage to organs through prolonged or repeated exposure.

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** Exposure to materials housed in battery: May be corrosive to the respiratory tract. Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death.

**Symptoms/Injuries After Skin Contact:** Exposure to materials housed in battery: Causes severe irritation which will progress to chemical burns.

**Symptoms/Injuries After Eye Contact:** Exposure to materials housed in battery: Causes permanent damage to the cornea, iris, or conjunctiva.

**Symptoms/Injuries After Ingestion:** Exposure to materials housed in battery: This material is toxic in small amounts orally, and can cause adverse health effects or death. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

**Chronic Symptoms:** Exposure to materials housed in battery: Causes damage to organs (teeth, bones, CNS, lungs) through prolonged or repeated exposure. May cause cancer (inhalation).

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

#### Ecology - General

: Exposure to materials housed in battery: Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Graphite (7782-42-5)	
LC50 Fish 1	> 100 mg/l (Exposure time: 96 h - Species: Danio rerio [semi-static])
EC50 - Crustacea [1]	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna [static])
ErC50 (Algae)	> 100 mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
NOEC Chronic Fish	> 100 mg/l (Exposure time: 96 h - Species: Danio rerio [semi-static])
NOEC Chronic Crustacea	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna [static])
NOEC Chronic Algae	> 100 mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
Copper (7440-50-8)	
LC50 Fish 1	0.0068 – 0.0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 - Crustacea [1]	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 Other Aquatic Organisms 1	0.0426 (0.0426 – 0.0535) mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
LC50 Fish 2	< 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Other Aquatic Organisms 2	0.031 (0.031 – 0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])
1,3-Dioxolan-2-one (96-49-1)	
LC50 Fish 1	> 100 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
Carbonate, methyl ethyl (623-53-0)	
LC50 Fish 1	> 100 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [semi-static])

### 12.2. Persistence and Degradability

SwitchPack	
Persistence and Degradability	May cause long-term adverse effects in the environment.
Copper (7440-50-8)	
Persistence and Degradability	Not readily biodegradable.

### 12.3. Bioaccumulative Potential

SwitchPack	
Bioaccumulative Potential	Not established.
Phosphoric acid, iron(2+) lithium salt (1:1:1) (15365-14-7)	
Partition coefficient n-octanol/water (Log Pow)	> 0.564 (at 20 °C)
1,3-Dioxolan-2-one (96-49-1)	
Partition coefficient n-octanol/water (Log Pow)	0.11 (at 20 °C (at pH >5.33-<5.79))
Carbonate, methyl ethyl (623-53-0)	



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Partition coefficient n-octanol/water (Log Pow)	0.972 (at 40 °C (at pH 6.8))
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## 12.4. Mobility in Soil

No additional information available

## 12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste Treatment Methods

**Waste Treatment Methods:** Material should be recycled if possible.

**Waste Disposal Recommendations:** Dispose of contents/container in accordance with local, regional, national, and international regulations.

**Additional Information:** Container may remain hazardous when empty. Continue to observe all precautions. Batteries should be completely discharged prior to disposal and/or the terminals taped or capped to prevent short circuit. When completely discharged it is not considered hazardous.

**Ecology - Waste Materials:** Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

## SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

### 14.1. In Accordance with DOT

Proper Shipping Name : LITHIUM ION BATTERIES  
Hazard Class : 9  
Identification Number : UN3480  
Label Codes : 9A



Marine Pollutant : Marine pollutant  
ERG Number : 147

### 14.2. In Accordance with IMDG

Proper Shipping Name : LITHIUM ION BATTERIES  
Hazard Class : 9  
Identification Number : UN3480  
Label Codes : 9A  
EmS-No. (Fire) : F-A  
EmS-No. (Spillage) : S-I



Marine Pollutant : Marine pollutant

### 14.3. In Accordance with IATA

Proper Shipping Name : LITHIUM ION BATTERIES  
Identification Number : UN3480  
Hazard Class : 9  
Label Codes : 9A  
ERG Code (IATA) : 12FZ



## SECTION 15: REGULATORY INFORMATION

### 15.1. US Federal Regulations

SwitchPack	
SARA Section 311/312 Hazard Classes	Health hazard - Carcinogenicity Health hazard - Specific target organ toxicity (single or repeated exposure) Health hazard - Acute toxicity (any route of exposure) Health hazard - Serious eye damage or eye irritation Health hazard - Skin corrosion or Irritation
<b>Cobalt lithium manganese nickel oxide (182442-95-1)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
EPA TSCA Regulatory Flag	PMN - PMN - indicates a commenced PMN substance. S - S - indicates a substance that is identified in a final Significant New Use Rule.

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	5E - 5E - indicates a substance that is the subject of a TSCA section 5E order.
<b>Phosphoric acid, iron(2+) lithium salt (1:1:1) (15365-14-7)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>EPA TSCA Regulatory Flag</b>	PMN - PMN - indicates a commenced PMN substance. S - S - indicates a substance that is identified in a final Significant New Use Rule. 5E - 5E - indicates a substance that is the subject of a TSCA section 5E order.
<b>Titanium dioxide (13463-67-7)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>Graphite (7782-42-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>1,1-Difluoroethylene polymer (24937-79-9)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>EPA TSCA Regulatory Flag</b>	XU - XU - indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711).
<b>Copper (7440-50-8)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active Subject to reporting requirements of United States SARA Section 313	
<b>CERCLA RQ</b>	5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm
<b>SARA Section 313 - Emission Reporting</b>	1 %
<b>1,3-Dioxolan-2-one (96-49-1)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>Carbonate, methyl ethyl (623-53-0)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>Phosphate(1-), hexafluoro-, lithium (21324-40-3)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active	
<b>EPA TSCA Regulatory Flag</b>	PMN - PMN - indicates a commenced PMN substance.
<b>Aluminum (7429-90-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active Subject to reporting requirements of United States SARA Section 313	
<b>SARA Section 313 - Emission Reporting</b>	1 % (dust or fume only)

### 15.2. US State Regulations

<b>Titanium dioxide (13463-67-7)</b>
U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List
<b>Graphite (7782-42-5)</b>
U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List
<b>Copper (7440-50-8)</b>
U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
<b>1,3-Dioxolan-2-one (96-49-1)</b>
U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Massachusetts - Right To Know List
<b>Aluminum (7429-90-5)</b>

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U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Massachusetts - Right To Know List  
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

### California Proposition 65



**WARNING:** This product can expose you to Titanium dioxide, which is known to the State of California to cause cancer.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

Chemical Name (CAS No.)	Carcinogenicity	Developmental Toxicity	Female Reproductive Toxicity	Male Reproductive Toxicity
Titanium dioxide (13463-67-7)	X			

## SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Date of Preparation or Latest Revision** : 04/12/2023

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

### GHS Full Text Phrases:

H225	Highly flammable liquid and vapor
H301	Toxic if swallowed
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H350	May cause cancer
H351	Suspected of causing cancer
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

SDS US (GHS HazCom)