Rechargeable Lithium Ion Battery Pack

Safety Data Sheet

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SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Rechargeable Lithium Ion Battery Pack

Product Code: BL1203; BL1203-BULK, BL2005; BL2005-BULK; BL2010; BL2010-BULK; BL2012; BL2012-BULK; BL2022; BL2022-BULK; BL4011; BL4011-BULK

Additional Information: This product is a sealed battery pack. Under normal conditions of use, this product is not expected to pose a hazard. The battery pack contains hazardous substances enclosed within it, which under normal conditions of use are not in contact with the user unless the battery is altered, used in conditions not meant for its use, or there is a spill, leak, fire, or other emergency which releases its contents. This Safety Data Sheet applies to the hazards presented by 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: Lithium-Ion battery pack.

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

Company

Ingersoll Rand
Industrial Technologies
800-A Beaty Street
Davidson, NC 28036
T 1-800-483-4981 (Product Support)

1.4. Emergency Telephone Number

Emergency Number : 1-800-424-9300 (US) +1 703-527-3887 (International)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US Classification

Acute Tox. 3 (Oral)	H301
Acute Tox. 2 (Inhalation:dust,mist)	H330
Skin Corr. 1A	H314
Eye Dam. 1	H318
Resp. Sens. 1B	H334
Skin Sens. 1	H317
Carc. 1A	H350
STOT SE 1	H370
STOT RE 1	H372
Aquatic Acute 1	H400
Aquatic Chronic 1	H410

Full text of hazard classes and H-statements : see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS05 GHS06 GHS08 GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H301 - Toxic if swallowed.
H314 - Causes severe skin burns and eye damage.
H317 - May cause an allergic skin reaction.
H318 - Causes serious eye damage.
H330 - Fatal if inhaled.
H334 - May cause an allergy or asthma symptoms or breathing difficulties if inhaled.
H350 - May cause cancer (Inhalation).
H370 - Causes damage to organs (respiratory tract corrosion) (Inhalation).
H372 - Causes damage to organs (lungs, brain, bones/teeth, and kidneys) through

prolonged or repeated exposure.
H400 - Very toxic to aquatic life.
H410 - Very 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 dust, fume, vapors.
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.
P272 - Contaminated work clothing must not be allowed out of the workplace.
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+P310 - If swallowed: Immediately call a poison center or doctor.
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.
P304+P341 - If inhaled: If breathing is difficult, remove person to fresh air and keep 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.
P307+P311 - If exposed: Call a poison center/doctor.
P314 - Get medical advice/attention if you feel unwell.
P320 - Specific treatment is urgent (see section 4 on this SDS).
P330 - Rinse mouth.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a poison center or doctor.
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	Product Identifier	%	GHS-US classification
Carbon	(CAS-No.) 7440-44-0	< 30	Comb. Dust
Nickel oxide (NiO)	(CAS-No.) 1313-99-1	< 30	Skin Sens. 1, H317 Carc. 1A, H350 STOT RE 1, H372 Aquatic Chronic 4, H413
Manganese oxide (MnO2)	(CAS-No.) 1313-13-9	< 30	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:dust,mist), H332 STOT RE 2, H373

Cobalt(II) oxide	(CAS-No.) 1307-96-6	< 30	Acute Tox. 3 (Oral), H301 Acute Tox. 2 (Inhalation:dust,mist), H330 Resp. Sens. 1B, H334 Skin Sens. 1, H317 Carc. 2, H351 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Phosphate(1-), hexafluoro-, lithium**	(CAS-No.) 21324-40-3	< 20	Acute Tox. 3 (Oral), H301 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT RE 1, H372
Dimethyl carbonate**	(CAS-No.) 616-38-6	< 20	Flam. Liq. 2, H225
Ethylene carbonate**	(CAS-No.) 96-49-1	< 20	Acute Tox. 4 (Oral), H302 Eye Irrit. 2A, H319 STOT RE 2, H373
Carbonate, methyl ethyl**	(CAS-No.) 623-53-0	< 20	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335
1,1-Difluoroethylene polymer	(CAS-No.) 24937-79-9	< 10	Comb. Dust
Copper	(CAS-No.) 7440-50-8	2 - 10	Comb. Dust
Aluminum	(CAS-No.) 7429-90-5	2 - 10	Comb. Dust

Full text of H-phrases: see section 16

** Electrolyte Components

Mercury, Cadmium, and Lead are below levels reportable for Section 3. Mercury Content: Hg <0.1 mg/kg. Cadmium Content: Cd < 1mg/kg. Lead Content: Pb < 10mg/kg.

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

First-aid Measures General: The following first aid measures apply in case of exposure to the interior battery components, if the battery is damaged and exposure occurs: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). Application of 2.5% calcium gluconate gel/solution to any affected area is recommended.

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: Remove contaminated clothing. Immediately flush skin with plenty of water for at least 30 minutes. Get immediate medical advice/attention. Wash contaminated clothing before reuse.

First-aid Measures After Eye Contact: For exposure to battery contents: Rinse cautiously 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: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

Symptoms/Injuries: Exposure to the internal battery contents may result in the following: Causes severe skin burns and eye damage. Toxic if swallowed. Fatal if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Skin sensitization. May cause cancer (Inhalation). Causes damage to organs (respiratory tract corrosion) (Inhalation). Causes damage to organs (lungs, brain, bones/teeth, and kidneys) through prolonged or repeated exposure.

Symptoms/Injuries After Inhalation: For exposure to the internal contents of the battery: Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death. Exposure may produce cough, mucous secretions, shortness of breath, chest tightness or other symptoms indicative of an allergic/sensitization reaction. Corrosive to the respiratory tract.

Symptoms/Injuries After Skin Contact: For exposure to the internal contents of the battery: Causes severe irritation which will progress to chemical burns. May cause an allergic skin reaction.

Symptoms/Injuries After Eye Contact: For exposure to the internal contents of the battery: Causes permanent damage to the cornea, iris, or conjunctiva.

Symptoms/Injuries After Ingestion: For exposure to the internal contents of the 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: For exposure to the internal contents of the battery: May cause cancer (Inhalation). Causes damage to organs (lungs, brain, bones/teeth, and kidneys) through prolonged or repeated exposure.

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. Application of 2.5% calcium gluconate gel/solution to any affected area is recommended.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Internal contents may react with water to generate hazardous gases. Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product is not explosive. If heated above 125°C (257°F) cells can explode.

Reactivity: Product itself is stable, but if damaged or opened can release toxic and corrosive hydrofluoric acid on contact with water or other incompatible materials. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. Contact with acids liberates toxic gas. Hazardous reactions may occur on contact with certain chemicals. Refer to incompatible materials.

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. Do not get water inside containers. Do not apply water stream directly at source of leak. Remove containers from fire area if this can be done without risk. Do not breathe fumes from fires or vapors from decomposition. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

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

Hazardous Combustion Products: Carbon oxides (CO, CO_2). Metal oxides. Oxides of nickel. Oxides of manganese. Oxides of cobalt. Lithium Compounds. Lithium oxides. Phosphorus oxides. Copper oxides. Aluminum oxides. Hydrogen Fluoride (HF). Corrosive vapors. Toxic fumes may be released.

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: For exposure to materials housed in battery: Do not get in eyes, on skin, or on clothing. Do not breathe vapor, fume, dust, or mist. Do not handle until all safety precautions have been read and understood.

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: Ventilate area. Evacuate unnecessary personnel. 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.

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 portion of spills with appropriate barriers and prevent migration and entry into sewers or streams. Contain any liquid spills with dikes or absorbents to 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: Clean up spills immediately and dispose of waste safely. If battery is not damaged cleanup spills mechanically, and put into approved container for disposal. If battery is damaged and/or leaking: Cautiously neutralize spilled solid and liquid material. Absorb and/or contain spill with inert material. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

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: Do not open or damage enclosure, or battery cell as this could cause a potential exposure and release of hazardous materials. Under normal conditions of use exposure to the ingredients contained within this product is unlikely. Exposure to internal contents of the batteries may occur if the product is misused or in an emergency. Batteries are designed to be recharged. However, improperly charging may cause the battery to flame. Use only approved chargers and procedures. 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. Do not expose to heat, or ignition sources as this could cause an explosion. If heated above 125°C (257°F) may explode. Do not puncture or incinerate container. May release corrosive vapors.

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. Do not handle until all safety precautions have been read and understood. 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. If damaged, do not get internal contents in eyes, on skin, or on clothing. Do not breathe dust, vapors, spray, or fumes from inner battery components. If damaged, use appropriate personal protective equipment (PPE).

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep/Store away from extremely high or low temperatures, ignition sources, direct sunlight, incompatible materials. Store in original container or corrosive resistant and/or lined container. Store locked up. Batteries should be separated from other materials and stored in a noncombustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not store batteries in a manner that allows terminals to short circuit. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods.

Incompatible Materials: Strong acids, strong bases, strong oxidizers. Water. Combustible materials. Peroxides. Moisture. Reducing agents. Alkalis.

Storage Temperature: 20 °C (68 °F); Room temperature

7.3. Specific End Use(s)

Lithium-Ion battery pack.

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).

Nickel oxide (NiO) (1313-99-1)		
USA ACGIH	ACGIH TWA (mg/m³)	0.1 mg/m³ (soluble Ni compounds) 0.2 (insoluble Ni compounds)
USA OSHA	OSHA PEL (TWA) (mg/m³)	1 mg/m³ (as Ni)

Copper (7440-50-8)		
USA ACGIH	ACGIH TWA (mg/m³)	0.2 mg/m³ (fume)
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1 mg/m³ (dust and mist) 0.1 mg/m³ (fume)
USA IDLH	US IDLH (mg/m³)	100 mg/m³ (dust, fume and mist)
USA OSHA	OSHA PEL (TWA) (mg/m³)	0.1 mg/m³ (fume) 1 mg/m³ (dust and mist)

Aluminum (7429-90-5)		
USA ACGIH	ACGIH TWA (mg/m³)	1 mg/m³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (mg/m³)	10 mg/m³ (total dust) 5 mg/m³ (respirable dust)
USA OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust) 5 mg/m³ (respirable fraction)

Cadmium compounds		
USA ACGIH	ACGIH TWA (mg/m³)	0.01 mg/m³ 0.002 mg/m³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Suspected Human Carcinogen
USA IDLH	US IDLH (mg/m³)	9 mg/m³ (dust and fume)

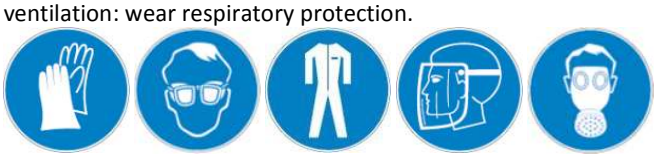
Lead compounds		
USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.05 mg/m³
USA IDLH	US IDLH (mg/m³)	100 mg/m³

Mercury compounds		
USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.05 mg/m³ (except Organo alkyls-vapor)
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	0.1 mg/m³ (except organo(alkyl) compounds)
USA IDLH	US IDLH (mg/m³)	10 mg/m³ (except Organo(alkyl) compounds)

8.2. Exposure Controls

Appropriate Engineering Controls : Ensure adequate ventilation, especially in confined areas. 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. Gas detectors should be used when flammable gases or vapors may be released. Ensure all national/local regulations are observed.

Personal Protective Equipment : Not required under normal conditions of use, when handling damaged batteries: Gloves. Protective goggles. Corrosion proof clothing. Face shield. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing : Chemically resistant materials and fabrics. Corrosion-proof clothing.

Hand Protection : Wear protective gloves.

Eye and Face Protection : Chemical safety goggles and face shield.

Skin and Body Protection : Wear suitable protective clothing.

Respiratory Protection : 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.

Environmental Exposure Controls : Avoid release to the environment.

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 : Manufactured Battery Cell

Odor : Odorless

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 : Water: Insoluble

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: Product itself is stable, but if damaged or opened can release toxic and corrosive hydrofluoric acid on contact with water or other incompatible materials. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. Contact with acids liberates toxic gas. Hazardous reactions may occur on contact with certain chemicals. Refer to incompatible materials.

10.2. Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4. Conditions to Avoid: Do not use unauthorized charger or charging method. Do not deconstruct or disassemble battery or solder battery. Damaging, puncturing, or opening the battery cell. Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

10.5. Incompatible Materials: Strong acids, strong bases, strong oxidizers. Water. Combustible materials. Peroxides. Moisture. Reducing agents. Alkalis.

10.6. Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates: Corrosive vapors. May release flammable gases. Carbon oxides (CO, CO2). Metal oxides. Hydrogen chloride. Hydrogen fluoride.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects

The information below reflects the hazards of the internal contents of the battery, which if damaged may be released.

Acute Toxicity: Oral: Toxic if swallowed. Inhalation:dust,mist: Fatal if inhaled.

Rechargeable Lithium Ion Battery Pack	
ATE (Oral)	145.21 mg/kg body weight
ATE (Dust/Mist)	0.19 mg/l/4h
Carbon (7440-44-0)	
LD50 Oral Rat	> 10000 mg/kg
Nickel oxide (NiO) (1313-99-1)	
LD50 Oral Rat	> 5000 mg/kg
LC50 Inhalation Rat	> 5.08 mg/l/4h
Manganese oxide (MnO2) (1313-13-9)	
ATE (Oral)	500.00 mg/kg body weight
ATE (Dust/Mist)	1.50 mg/l/4h
Cobalt(II) oxide (1307-96-6)	
LD50 Oral Rat	159 mg/kg
LD50 Dermal Rat	> 2000 mg/kg
LC50 Inhalation Rat	0.06 mg/l/4h
Phosphate(1-), hexafluoro-, lithium (21324-40-3)	
LD50 Oral Rat	50 - 300 mg/kg
Dimethyl carbonate (616-38-6)	
LD50 Oral Rat	13 g/kg
LD50 Dermal Rabbit	> 5 g/kg
LC50 Inhalation Rat	140 mg/l/4h
Ethylene carbonate (96-49-1)	
LD50 Dermal Rat	> 2000 mg/kg
ATE (Oral)	500.00 mg/kg body weight
Carbonate, methyl ethyl (623-53-0)	
LD50 Oral Rat	> 15000 mg/kg

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.

Serious Eye Damage/Irritation: Causes serious eye damage.

Respiratory or Skin Sensitization: May cause an allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer (Inhalation).

Nickel oxide (NiO) (1313-99-1)

IARC group	1
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity.
Cobalt(II) oxide (1307-96-6)	
IARC group	2B
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Cadmium compounds	
IARC group	1
National Toxicology Program (NTP) Status	Known Human Carcinogens.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
OSHA Specifically Regulated Carcinogen List	In OSHA Specifically Regulated Carcinogen list.
Lead compounds	
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Causes damage to organs (respiratory tract corrosion) (Inhalation).

Specific Target Organ Toxicity (Repeated Exposure): Causes damage to organs (lungs, brain, bones/teeth, and kidneys) through prolonged or repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: For exposure to the internal contents of the battery: Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death. Exposure may produce cough, mucous secretions, shortness of breath, chest tightness or other symptoms indicative of an allergic/sensitization reaction. Corrosive to the respiratory tract.

Symptoms/Injuries After Skin Contact: For exposure to the internal contents of the battery: Causes severe irritation which will progress to chemical burns. May cause an allergic skin reaction.

Symptoms/Injuries After Eye Contact: For exposure to the internal contents of the battery: Causes permanent damage to the cornea, iris, or conjunctiva.

Symptoms/Injuries After Ingestion: For exposure to the internal contents of the 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: For exposure to the internal contents of the battery: May cause cancer (Inhalation). Causes damage to organs (lungs, brain, bones/teeth, and kidneys) through prolonged or repeated exposure.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : This information applies to the materials enclosed inside of the battery pack. If the battery is misused, altered outside of its normal conditions of use, or there is a spill, leak, fire, or other emergency, and the contents are released: the internal contents are considered very toxic to aquatic life, and very toxic to aquatic life with long lasting effects.

Nickel oxide (NiO) (1313-99-1)	
LC50 Fish 1	> 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
EC50 Daphnia 1	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Dimethyl carbonate (616-38-6)	
LC50 Fish 1	> 100 mg/l Species: Danio rerio
EC50 Daphnia 1	> 100 mg/l Species: Daphnia magna
ErC50 (Algae)	> 100 mg/l SPecies: Pseudokirchnerella subcapitata
NOEC Chronic Fish	> 100 mg/l Species: Danio rerio
NOEC Chronic Crustacea	25 mg/l Species: Daphnia magna
NOEC Chronic Algae	> 100 mg/l Species: Pseudokirchnerella subcapitata

12.2. Persistence and Degradability

Rechargeable Lithium Ion Battery Pack	
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

Rechargeable Lithium Ion Battery Pack	
Bioaccumulative Potential	Not established.
Manganese oxide (MnO2) (1313-13-9)	
BCF Fish 1	(no bioaccumulation expected)
Log Pow	< 0 (at 20 °C)

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

Additional Information: Recycle the material as far as possible. Do not puncture or incinerate container.

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. If this product is packed with or contained in equipment, or its packaging is altered it is the responsibility of the shipper to perform a new classification for each subsection below.

14.1. In Accordance with DOT

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

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 : 9
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-I

Marine Pollutant : Marine pollutant
MFAG Number : 147

14.3. In Accordance with IATA

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

ERG Code (IATA) : 9F

These batteries are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria.

Test results of the UN Recommendation on the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)		Test Results	Remark
No	Test Item		
T1	Altitude Simulation	Pass	
T2	Thermal test	Pass	
T3	Vibration	Pass	

T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact	Pass	
T7	Overcharge	Pass	For pack only
T8	Forced discharge	Pass	For cell only

Battery Information by Model

Model	Voltage (V)	Capacity (Ah)	Capacity (Wh)	Weight (kg)
BL1203 / BL1203-BULK	12	2.0	24	0.23
BL2005 / BL2005-BULK	20	1.5	30	0.43
BL2012 / BL2012-BULK		2.5	50	0.43
BL2010 / BL2010-BULK		3.0	60	0.73
BL2022 / BL2022-BULK		5.0	100	0.73
BL4011 / BL4011-BULK	40	2.5	100	0.70

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Rechargeable Lithium Ion Battery Pack	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

Carbon (7440-44-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nickel oxide (NiO) (1313-99-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Manganese oxide (MnO2) (1313-13-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Cobalt(II) oxide (1307-96-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Phosphate(1-), hexafluoro-, lithium (21324-40-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	P - P - indicates a commenced PMN substance.

Dimethyl carbonate (616-38-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethylene carbonate (96-49-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Carbonate, methyl ethyl (623-53-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

1,1-Difluoroethylene polymer (24937-79-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e, Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C)).

Copper (7440-50-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	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
SARA Section 313 - Emission Reporting	1 %

Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (dust or fume only)

Cadmium compounds

Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %

Lead compounds
Subject to reporting requirements of United States SARA Section 313

Mercury compounds	
Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %

15.2. US State Regulations

Nickel oxide (NiO) (1313-99-1)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Cobalt(II) oxide (1307-96-6)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Cadmium compounds	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Lead compounds	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Mercury compounds	
U.S. - California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to the State of California to cause birth defects.

Carbon (7440-44-0)
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Nickel oxide (NiO) (1313-99-1)
U.S. - California - SCAQMD - Toxic Air Contaminants - Carcinogens
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - SDAPCD - Toxic Air Contaminants - Carcinogenic Impacts Must Be Calculated
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Minnesota - Chemicals of High Concern
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - South Carolina - Toxic Air Pollutants - Maximum Allowable Concentrations
U.S. - South Carolina - Toxic Air Pollutants - Pollutant Categories
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Manganese oxide (MnO2) (1313-13-9)
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual

U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Cobalt(II) oxide (1307-96-6)

U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Illinois - Toxic Air Contaminants
U.S. - Maine - Chemicals of High Concern
U.S. - Minnesota - Chemicals of High Concern
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Phosphate(1-), hexafluoro-, lithium (21324-40-3)

U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Dimethyl carbonate (616-38-6)

U.S. - Delaware - Volatile Organic Compounds Exempt from Requirements
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Volatile Organic Compounds Exempt From Requirements
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Ethylene carbonate (96-49-1)

RTK - U.S. - Massachusetts - Right To Know List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Copper (7440-50-8)

U.S. - California - Priority Toxic Pollutants - Freshwater Criteria
U.S. - California - Priority Toxic Pollutants - Human Health Criteria
U.S. - California - Priority Toxic Pollutants - Saltwater Criteria
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Colorado - Primary Drinking Water Regulations - Maximum Contaminant Level Goals (MCLGs)
U.S. - Colorado - Primary Drinking Water Regulations - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Connecticut - Drinking Water Quality Standards - Groundwater Sources
U.S. - Connecticut - Drinking Water Quality Standards - Maximum Contaminant Levels
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Consumption of Water and Organisms
U.S. - Connecticut - Water Quality Standards - Health Designations
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Drinking Water Standards - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Illinois - Toxic Air Contaminants
U.S. - Maryland - Surface Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Maryland - Surface Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Maryland - Surface Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Maryland - Surface Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Maryland - Surface Water Quality Standards - Consumption of Water and Organisms

U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Drinking Water - Maximum Contaminant Levels (MCLs)
U.S. - Massachusetts - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Michigan - Polluting Materials List
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - Missouri - Drinking Water - Maximum Contaminant Levels (MCLs)
U.S. - Missouri - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - New Hampshire - Drinking Water - Maximum Contaminant Levels (MCLs)
U.S. - New Hampshire - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Primary Drinking Water Standards - Action Levels - ALs
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - North Dakota - Water Quality Standards - Aquatic Life Acute Value for Classes I, IA, II, III
U.S. - North Dakota - Water Quality Standards - Aquatic Life Chronic Value for Classes I, IA, II, III
U.S. - North Dakota - Water Quality Standards - Human Health Value for Classes I, IA, II
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
U.S. - Pennsylvania - Beneficial Use of Sewage Sludge by Land Application - Pollutant Ceiling Limits
U.S. - Pennsylvania - Drinking Water - Maximum Contaminant Levels (MCLs)
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Human Health Criteria for Consumption of Water and Aquatic Organisms
U.S. - South Carolina - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Utah - Drinking Water - Maximum Contaminant Levels (MCLs)
U.S. - Utah - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Vermont - Permissible Exposure Limits - TWAs

U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - West Virginia - Water Quality - Groundwater Standards - Ceiling Concentrations
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water
U.S. - Arkansas - Surface Water Quality Standards - Chronic Aquatic Life Criteria
U.S. - Arkansas - Surface Water Quality Standards - Acute Aquatic Life Criteria

Aluminum (7429-90-5)

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Colorado - Primary Drinking Water Regulations - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Drinking Water Standards - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Massachusetts - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - Missouri - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Nevada - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - New Hampshire - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Secondary Drinking Water Standards - Recommended Upper Limits (RULs)
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Water Quality - Standards for Ground Water of 10,000 mg/L TDS Concentration or Less
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
U.S. - Pennsylvania - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria

U.S. - South Carolina - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Drinking Water Standards - Secondary Constituent Levels (SCLs)
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Utah - Drinking Water - Secondary Maximum Contaminant Levels (SMCLs)
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water

Cadmium compounds

U.S. - California - SCAQMD - Toxic Air Contaminants - Carcinogens
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - SDAPCD - Toxic Air Contaminants - Carcinogenic Impacts Must Be Calculated
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Idaho - Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Illinois - Toxic Air Contaminants
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants
U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Hampshire - Prohibited Volatile Organic Compounds
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - North Dakota - Air Pollutants - Unit Risk Factors
U.S. - Oregon - Priority Persistent Pollutant - Tier I - Persistent Pollutants
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Hazardous Waste - Hazardous Constituents
U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

Lead compounds

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Illinois - Toxic Air Contaminants
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants

U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New York - Priority Chemical Avoidance List
U.S. - Oregon - Priority Persistent Pollutant - Tier I - Persistent Pollutants
U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Vermont - Hazardous Waste - Hazardous Constituents
U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List

Mercury compounds

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Illinois - Toxic Air Contaminants
U.S. - Maine - Air Pollutants - Hazardous Air Pollutants
U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New York - Part 326 - Restricted Pesticides
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Vermont - Hazardous Waste - Hazardous Constituents
U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List

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

Date of Preparation or Latest Revision : 11/06/2017

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:

Acute Tox. 2 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 2
Acute Tox. 3 (Oral)	Acute toxicity (oral) Category 3
Acute Tox. 4 (Dermal)	Acute toxicity (dermal) Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation) Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 4	Hazardous to the aquatic environment - Chronic Hazard Category 4

Carc. 1A	Carcinogenicity Category 1A
Carc. 2	Carcinogenicity Category 2
Comb. Dust	Combustible Dust
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Liq. 2	Flammable liquids Category 2
Flam. Liq. 3	Flammable liquids Category 3
Resp. Sens. 1B	Respiratory sensitization, Category 1B
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Irrit. 2	Skin corrosion/irritation Category 2
Skin Sens. 1	Skin sensitization, Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 1	Specific target organ toxicity (single exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H225	Highly flammable liquid and vapor
H226	Flammable liquid and vapor
H301	Toxic if swallowed
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H330	Fatal if inhaled
H332	Harmful if inhaled
H334	May cause an allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H350	May cause cancer
H351	Suspected of causing cancer
H370	Causes damage to organs
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
H413	May cause long lasting harmful effects to aquatic life

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)