

## **Material Safety Data Sheet**

Section 1. Chemical Product and Company Identification			
Products Name Rechargeable Li-ion Battery			
Mode/Type reference	18650/4S1P/3350mAh/14.4V		
Nominal Voltage	14.4V		
Capacity	2950mAh (Rated)/3350mAh (Nominal)		
Typical Power	42.48Wh		
Manufacture Name	Dongguan Large Electronics Co.,Ltd		
Address	No. 8 Jingyi Road, Dongcheng District, Dongguan City, Guangdong Province, China		
Postcode	523017		
<b>Emergency Telephone No.</b>	+86-769-22810105 💥 🖈 🗖 🔥		
Technical Support Telephone No.	+86-769-22810105		
Fax	+86-769-22813796		
E-mail	jcrz@juda.cn		
Issue Date	2024-01-01		

## Section 2. Hazards Identification

### Classification

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

Skin corrosion/irritation	Category 4	
Serious eye damage/eye	Category4	
Skin sensitization	Category3	
Specific target organ toxicity (repeated exposure)	Category3	

# GHS Label elements, including precautionary statements Emergency Overview

**Signal word:** Danger **Hazard Statements** Causes skin irritation

Causes serious eye irritation

May cause an allergic skin reaction

May cause cancer



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This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold.

Intended use of the product should not result in exposure to the chemical substance This is a battery. In case of rupture: the above hazards exist.

Appearance: White	Physical State: Prismatic	Odor: Odorless		
	Obtain special instructions before use			
	Do not handle until all safety precautions have	been read and understood		
Precautionary	Use personal protective equipment as required	d		
Statements -	Wash face, hands and any exposed skin thoro	ughly after handling		
Prevention	Contaminated work clothing should not be allo	wed out of the workplace		
i revention	Wear protective gloves			
	Do not breathe dust/fume/gas/mist/vapors/spra	ay		
	Do not eat, drink or smoke when using this pro	oduct		
	IF exposed or concerned: Get medical advice/	attention		
	Specific treatment (see supplemental first aid i	nstructions on this label)		
Precautionary	IF IN EYES: Rinse cautiously with water for se	veral minutes. Remove contact		
Statements -	lenses, if present and easy to do. Continue rins	sing If eye irritation persists: Get		
Response	medical advice/attention			
Response	IF ON SKIN: Wash with plenty of soap and wa	ter		
	Take off contaminated clothing and wash before	re reuse		
	If skin irritation or rash occurs: Get medical adv	vice/attention		
Precautionary				
Statements -	Store locked up			
Storage				
Precautionary				
Statements -	Dispose of contents/container to an approved waste disposal plant			
Disposal				
Hazards not				
otherwise	Not applicable			
classified				
(HNOC)				
Unknown				
Toxicity				
Other	May be harmful if swallowed Very toxic to aquatic life with long lasting effects			
information	Repeated or prolonged skin contact may cause allergic reactions with susceptible			



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	persons
Interactions	
with Other	No information available.
Chemicals	

## Section 3. Composition/Information on Ingredients

Chemical Name	CAS Number	Weight-%	Trade Secret
Lithium Cobalt Dioxide	12190-79-3	11.5~23.5 %	
Lithium manganate	12057-17-9	11.5~23.5 %	
Nickel(III) oxide	1314-06-3	11.5~23.5 %	
Polyvinylidene fluoride (PVdF)	24937-79-9	0.5%~1.5%	
Aluminium foil	7429-90-5	3%~4%	
Graphite (C)	7440-44-0	17 %~19%	
Styrene Butadiene Rubber(SBR)	9003-55-8	≤1%	
Carboxy Methylated Cellulose(CMC)	9004-32-4	≤1%	
Copper foil	7440-50-8	6.5%~7.5%	
Polyethylene (PE)	9002-88-4	3.5%~4.5%	
Electrolyte (*)	21324-40-3/623-53-0	11%~14 %	
Iron(Fe)	7439-89-6	9%-10.5%	
Chromium(Cr)	7440-47-3	2%~2.5%	
Nickel(Ni)	7440-02-0	0.75~1.25%	

<sup>(\*)</sup> Main ingredients: Lithium hexafluorophosphate, organic carbonates.

## Section 4. First Aid Measures

First aid is upon rupture of sealed battery.

**Eye contact:** If symptoms persist, call a physician. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do.

Continue rinsing. Do not rub affected area.

#### **General Advice**

**Skin contact:** Wash off immediately with soap and plenty of water for at least 15 minutes. In the case of skin irritation or allergic reactions see a physician. May cause an allergic skin reaction.

**Inhalation:** Remove to fresh air. If symptoms persist, call a physician. Get medical attention immediately if symptoms occur.

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

<sup>\*</sup> The exact percentage (concentration) of composition has been withheld as a trade secret.



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	Self-protection of the first aider: Avoid contact with skin, eyes or clothing. Use		
	personal protective equipment as required. Wear personal protective		
	clothing (see section 8).		
Maat impartant	cioning (coo occion o).		
Most important			
symptoms and	Most important symptoms and effects: Itching. Coughing and/ or wheezing.		
effects, both acute			
and delayed			
Indication of any	Notes to Physician: Treat symptomatically. May cause sensitization of susceptible		
immediate medical			
attention and	persons.		
special treatment			
needed			
Section 5. Fire I	Fighting Measures		
Suitable	Use extinguishing measures that are appropriate to local circumstances and the		
extinguishing Media	surrounding environment.		
Unsuitable			
Extinguishing Media	CAUTION: Use of water spray when fighting fire may be inefficient.		
Specific Hazards			
arising from the	Product is or contains a sensitizer. May cause sensitization by skin contact.		
chemical			
Hazardous			
Combustion	Carbon oxides.		
Products	Calbuit Unides.		
	Sensitivity to Mechanical Impact: No.		
Explosion Data	Sensitivity to Static Discharge: No.		
Protective	Sensitivity to Static Discharge. No.		
	As in any fire was realf contained breathing apparent a pressure demand		
Equipment	As in any fire, wear self-contained breathing apparatus pressure-demand,		
and precautions for	MSHA/NIOSH (approved or equivalent) and full protective gear.		
firefighters	firefighters		
Section 6. Accidental Release Measures			
Personal Precautions,	, Personal Precautions: Avoid contact with skin, eyes or clothing. Ensure adequate		
protective equipment,	ventilation. Use personal protective equipment as required. Evacuate personnel to		
and emergency	safe areas.		
procedures	Other Information: Refer to protective measures listed in Sections 7 and 8.		
Environmental	Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or		
Precautions	spillage if safe to do so.		
Methods and material			
for containment and	Methods for Containment: Prevent further leakage or spillage if safe to do so.		
	<b>Methods for cleaning up:</b> Pick up and transfer to properly labeled containers.		
cleaning up			



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Section 7 – Handling and Storage		
Precautions for safe handling	Handling: In case of rupture. Use personal protection equipment. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not breathe dust/fume/gas/mist/vapors/spray.	
Conditions for safe storage, including any	Storage: Keep containers tightly closed in a dry, cool and well-ventilated place.	
incompatibilities	Incompatible Products: Strong acids. Strong oxidizing agents. Strong bases.	

## Section 8. Exposure Controls/Personal Protection

### **Control parameters**

**Exposure Guidelines** 

Exposure Guidelines		ACGIH TLV	OSHA PEL	NIOSH IDLH
Lithium Oxide (CoLiO2) 12190-79-3	Cobalt	TWA: 0.02 mg/m³		
Copper 7440-50-8		TWA:0.2mg/m³ fume TWA:1mg/m³ Cu dust and mist	TWA:0.1mg/m³ fume TWA:1mg/m³ dust and mist (vacated) TWA:0.1g/m³ Cu dust,fume,mist	IDLH:100mg/m³dust,fume and mist TWA:1 mg/m³dust and mist TWA: 0.1 mg/m³ fume
Aluminum 7429-90-5		TWA:1mg/m³ respirale frcation	TWA:15mg/m³ total dust TWA:5mg/m³ respirable fraction(vacated) TWA:15mg/m³ total dust(vacated) TWA:5mg/m³ respirable fraction(vacated) TWA:5mg/m³ AL Aluminum	TWA:10 mg/m³ total dust TWA:5mg/m³ respirable dust
Graphite 7782-42-5		TWA:2mg/m³ Respirable fraction all forms except graphite fibers	TWA:15mg/m³ total dust synthetic TWA:5mg/m³ respirable fraction synthetic TWA:2.5mg/m³ respirable dust natural(vacated) TWA:10mg/m³ total dust synthtic	IDLH:1250 mg/m³ TWA:2.5 mg/m³ respirable dust

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

### **Other Exposure Guidelines**

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992) See section 15 for national exposure control parameters

**Engineering Controls** Keep away from heat and open flame.



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V421-42	Not necessary under conditions of normal use. In case of abuse, use adequate		
Ventilation	mechanical ventilation (local exhaust) for the battery that vent gas or fumes.		
	Not necessary under conditions of normal use. If battery is burning, leave the area		
Degninetony Protection	immediately. During fire fighting fireman should use self-contained breathing, full-face		
Respiratory Protection	respiratory equipment. Fires may be fought but only from safe fire fighting distance,		
	evacuate all persons from the area of fire immediately.		
Evo Protection	Not necessary under conditions of normal use. Use safety glasses with side shields if		
Eye Protection	handling a leaking or ruptured battery.		
Pady Protection	Not necessary under conditions of normal use. Use rubber apron and protective		
Body Protection	working in case of handling a leaking of ruptured battery.		
Protective Gloves	Not necessary under conditions of normal use. Use chemical resistant rubber gloves if		
Protective Gloves	handling a leaking or ruptured battery.		
	Use good chemical hygiene practice. Wash hands thoroughly after cleaning-up a		
Others	battery spill caused by leaking battery. No eating, drinking, or smoking in battery		
	storage area.		

## Section 9. Physical and Chemical Properties

## Information on basic physical and chemical properties

State	No data available
Colour	White
Odor	No data available
Odor Threshold	No data available
рН	No data available
Melting / freezing point	No data available
Boiling point / boiling range	No data available
Flash Point	No data available
Evaporation Rate	No data available
Flammability (solid, gas)	No data available
Explosion Limits(vol% in air)	No data available
Vapor pressure	No data available
Vapor density	No data available
Specific Gravity	No data available
Water Solubility	No data available
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	0.0001
Autoignition temperature	130℃
Decomposition temperature	No data available
Kinematic viscosity	No data available



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Dynamic viscosity		0.0001	
Explosive properties		No data available	
Oxidizing Properties		No data available	
Other Information			
Softeni	ng Point	No data available	
VOC Co	ntent (%)	No data available	
Partic	le Size	No data available	
Particle Siz	e Distribution	No data available	
Section 10. Sta	bility and Reac	tivity	
Stability	Stable		
Conditions to Avoid	Do not heat, throw into	fire, disassemble, short circuit, immerse in water or overcharge, etc.	
Incompatibility	None during normal ope	eration. Avoid exposure heat, open flame and corrosives.	
Hazardous Polymerization	Hazardous polymerization does not occur.		
Hazardous Decomposition Products	The battery may release irritative gas once the electrolyte leakage.		
Section 11. To	xicological Info	rmation	
Information on likely	routes of exposure		
Product Information  Product does not present an acute toxicity hazard based on known or supplied information. In case of rupture:.			
Inhalation Specific test data for the substance or mixture is not available. May call irritation of respiratory tract.		·	
Specific test data for the substance an irritant based on components.		data for the substance or mixture is not available. Expected to be sed on components. Irritating to eyes. May cause redness, pain. May cause temporary eye irritation.	
Skin Contact an irritant bas		data for the substance or mixture is not available. Expected to be used on components. Irritating to skin. Prolonged contact may ss and irritation.	
Ingestion cause irritation		data for the substance or mixture is not available. Ingestion may on to mucous membranes. Ingestion may cause gastrointestinal usea, vomiting and diarrhea.	
Component Informat	ion		
_   -		Erythema (skin redness). May cause redness and tearing of the	
effects eyes. Itchin		g. Rashes. Hives.	



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Delayed and immediate effects as well as chronic effects from short and long-term exposure Sensitization: May cause sensitization of susceptible persons. May cause

sensitization by skin contact.

Mutagenic Effects: No information available.

Carcinogenicity: The table below indicates whether each agency has listed

any ingredient as a carcinogen

Chemical Name	ACGIH	IARC	NTP	OSHA
Lithium Cobalt				
Oxide (CoLiO2)	A3	Group 2B		X
12190-79-3				

### ACGIH (American Conference of Governmental Industrial Hygienists)

A3 - Animal Carcinogen

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

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

Group 3 - Not Classifiable as to Carcinogenicity in Humans

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

X - Present

Reproductive Toxicity	No information available.		
STOT - single exposure	No information available.		
STOT – repeated exposure	Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).		
Chronic Toxicity	Contains a known or suspected carcinogen. Avoid repeated exposure.  Prolonged exposure may cause chronic effects. May cause adverse liver effects.		
Target Organ Effects  Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Central Value System (CVS). Kidney. Liver. Lungs. Heart.			
Aspiration Hazard	No information available.		
Numerical measures of toxicity	Product Information		

The values which are on the
right are calculated based on
chapter 3.1 of the GHS
document.

ATEmix (oral)
ATEmix (dermal)

ATEmix (inhalation-dust/mist)

## Section 12. Ecological Information



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### **Ecotoxicity**

Very toxic to aquatic life with long lasting effects

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to	Daphnia Magna
			Microorganisms	(Water flea)
Copper	96h EC50: 0.031 - 0.054	96h LC50: 0.0068 - 0.0156		48h EC50: = 0.03 mg/L
7440-50-8	mg/L (Pseudokirchneriella	mg/L (Pimephales promelas)		
	subcapitata) 72h EC50:	96h LC50: = 0.112 mg/L(Poecilia reticulata)		
	0.0426 - 0.0535 mg/L	96hLC50: = 0.3 mg/L (Cyprinus carpio)		
	(Pseudokirchneriella	96h LC50: = 0.8mg/L (Cyprinus carpio)		
	subcapitata)	96h LC50: = 1.25 mg/L(Lepomis macrochirus)		
		96h LC50: =0.052 mg/L (Oncorhynchus		
		mykiss)		
		96h LC50: = 0.2mg/L (Pimephales promelas)		
		96h LC50: < 0.3 mg/L (Pimephales promelas)		

Persistence and Degradability	No information available.	
Bioaccumulation	No information available	
Other adverse effects	No information available	

## Section 13. Disposal Considerations

#### Waste treatment methods

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

Contaminated Packaging: Dispose of in accordance with federal, state and local regulations.

## California Hazardous Waste Codes 141

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

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

## Section 14. Transport Information

The Rechargeable Lithium Ion Battery stated in appendix is made in compliance to packing Instruction of PI965



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section IB or PI966 section II or PI967 section II stated in the latest edition of the IATA Dangerous Goods Regulations.

With regard to transportation, following regulations are cited and considered:

- -The International Civil Aviation Organization (ICAO) Technical Instructions, packing instructions of PI 965 section IB or PI 966 section II or PI 967 section II.
- The International Air transport Association (IATA) Dangerous Goods Regulations, packing instructions of 965 section IB or 966 section II or 967 section II (65<sup>th</sup> Edition, 2024).
- Special provision 188 of the International Maritime Dangerous Goods (IMDG) Code (Amendment 41-22 Edition).
- The US Hazardous Materials Regulation 49 CRF (Code of Federal Regulations), sections 173-185 Lithium batteries and cells.
- UN Recommendations on transportation of Dangerous Goods, UN38.3 Manual of Tests and Criteria for lithium battery

Dangerous Goods Model Regulations and the Manual of Tests and Criteria.

- UN Number: UN3480, UN3481

#### Additional Requirements for air transport:

- 1. Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- 2. Cells and batteries must be manufactured under a quality management program.
- 3. The Watt-hour rating must be marked on the outside of the battery case except those manufactured before 1 January 2009.
- 4. Cells and batteries must be packed in strong outer packaging. (applicable to PI 965 only)
- 5. Maximum number of cells per package must not be more than 8 cells. (applicable to PI 965 only)
- 6. Cells and batteries must be packed in inner packaging that completely enclose the cell or battery. To provide protection from damage or compression to the batteries, the inner packaging must be placed in a strong rigid outer packaging of one of the packaging types shown below.
- 7. Each package must be capable of withstanding a 1.2 m drop test in any orientation without (applicable to PI 965 only):
- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.
- 8. Each consignment must be accompanied with a document with an indication that:
- the package contains lithium ion cells or batteries;
- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and a telephone number for additional information.
- 9. Each package must be labeled with a lithium battery handling label (Figure 7.4.H).
- 10. A Shipper's Declaration for Dangerous Goods is not required.
- 11. The words "Lithium ion batteries in compliance with Section II of PI 965" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and

Quantity of Goods" box of the air waybill. (applicable to PI 965 only)



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- 12. Any person preparing or offering cells for transport must receive adequate instruction on these requirements commensurate with their responsibilities.
- 13. The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation. (applicable to PI 966 only)
- 14. The maximum number of batteries in each package must be the minimum number required to power the equipment plus two spares. (applicable to PI 966 only)
- 15. The words "Lithium ion batteries in compliance with Section II of PI 966" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill. (applicable to PI 966 only).

## Section 15. Regulatory Information

#### Law Information

《California Proposition 65》

《Canadian Domestic Substances List/Non-Domestic Substances List》 (DSL/NDSL)

《Classification and code of dangerous goods》

《Code of Federal Regulations》 (CFR)

《Consumer Product Safety Act》 (CPSA)

《Dangerous Goods Regulation 65<sup>th</sup> Edition》

《Federal Environmental Pollution Control Act》 (FEPCA)

《International Maritime Dangerous Goods 41-22 Edition》

《Occupational Safety and Health Act》 (OSHA)

《Recommendations on Transport of Dangerous Goods Model Regulations》

《Resource Conservation and Recovery Act》 (RCRA)

《Safety Drinking Water Act》 (CWA)

《Superfund Amendments and Reauthorization Act III(302/311/312/313)》(SARA)

《Technical Instructions for the Safe Transport of Dangerous Goods》

《The Oil Pollution Act》(OPA)

《Toxic Substances Control Act》 (TSCA)

«US Federal Regulations»

#### **SARA 313**

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

Chemical Name	CAS No	Weight-%	SARA 313 – Threshold Values %
Lithium Cobalt Oxide(LiCoO <sub>2</sub> )	12190-79-3	40%~44%	0.1
Copper Foil	7440-50-8	8%~11%	1.0
Aluminum Foil	7429-90-5	4%~6%	1.0

### SARA 311/312 Hazard Categories

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



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Reactive Hazard	No
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### CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean

Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA -Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA -Hazardous Substances
Copper Foil 7440-50-8		×	×	

#### **CERCLA**

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

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Copper Foil	50001b		RQ 5000 lb final RQ
7440-50-8	300010		RQ 2270 kg final RQ

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

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Lithium Cobalt Dioxide	X		X	X	X
(LiCoO <sub>2</sub> ) 12190-79-3	Λ		Λ	Λ	Λ
Graphite 7782-42-5	X	X	X		
Copper	v	X	X	v	v
7440-50-8	X	Λ	Λ	X	X
Aluminum	v	V	V	v	
7429-90-5	X	X	A	X	

### **International Regulations**

#### Mexico

### National occupational exposure limits

Component	Carcinogen Status	<b>Exposure Limits</b>
Copper Foil 7440-50-8		Mexico: TWA=1 mg/m³
		Mexico: TWA=0.2 mg/m <sup>3</sup>
		Mexico: STEL=2 mg/m <sup>3</sup>
Aluminum Foil 7429-90-5		Mexico: TWA=10mg/m³
Graphite 7782-42-5		Mexico: TWA= 2 mg/m <sup>3</sup>

Mexico - Occupational Exposure Limits - Carcinogens

#### Canada

### **WHMIS Hazard Class**

Non-controlled

Chemical Name	NPRI
Aluminum	X

In accordance with all Federal, State and local laws.



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## **Section 16. Other Information**

	NFPA	Health Hazards 1	Flammability 0	Instability 0	Physical and
	ПМІС	LIMIC IIkl. IIl. 0	El 1994 0	T 4 1 114 0	Chemical Hazards -
	HMIS Health Hazards 0	Flammability 0	Instability 0	Personal Protection X	

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

Revision Note: No information available

**Disclaimer** 

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

--- End of Safety Data Sheet---