



Excell Battery
18525 53rd Ave, Unit 133
Surrey, BC V3S 7A4
Tel: 604-575-5011 Fax: 604-575-5052

Emergency Telephone Number
1-800-633-8253 Within USA and Canada
1-801-629-0667 Outside USA and Canada

BATTERY SAFETY DATA SHEET

Secondary Lithium Ion single cell and multi-cell battery packs

According to European REACH regulation (EC 1907/2006) and to OSHA regulation (29 CFR 1910.1200), batteries are ARTICLES with no intended release. As such, they are not covered by legal requirements to generate and supply an SDS or an MSDS.

This Battery Safety Data Sheet is provided solely as information document for the purpose of assisting our customers.

SECTION 1 – IDENTIFICATION

Product Name: LITHIUM ION RECHARGEABLE BATTERY (OR, LITHIUM ION SECONDARY BATTERY)
Product type/Model: LITHIUM ION RECHARGEABLE BATTERY

SECTION 2 – COMPOSITION, INFORMATION ON INGREDIENTS

Positive electrode; Lithium cobalt oxide, or Lithium Nickel Cobalt Oxide, or Lithium Manganese Oxide, or Lithium Iron Phosphate	20 – 35wt%
Negative electrode; Carbon	10 – 20wt%
Electrolyte; Organic electrolyte mainly composed of alkyl carbonate	10 – 20wt%

SECTION 3 – HAZARDS IDENTIFICATION

****DANGER**** INTERNAL CONTENTS ARE EXTREMELY HAZARDOUS. LEAKING FLUID IS CORROSIVE AND DANGEROUS UPON INHALATION. BATTERY MAY BE EXPLOSIVE AT HIGHER TEMPERATURES.

Do not expose to temperatures above the maximum rated temperature as specified by the manufacturer due to leak hazard.

It may cause heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.

If cell or battery leaks or vents

Primary Routes of Entry: Inhalation

Carcinogenicity: Not listed by NTP, IARC, or regulated by OSHA.

Health Hazards: Acute – Vapors are very irritating to skin, eyes, and mucous membranes.

Chronic – Overexposure can cause symptoms of non-fibrotic lung injury

Signs and Symptoms of Exposure: Eye and mucous membrane irritation.

Medical Conditions Generally Aggravated by Exposure: Asthma, other respiratory disorders, skin allergies, and eczema.

SECTION 4 – FIRST AID MEASURES

Eye Contact: Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Take a medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.

Skin Contact: Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration.

Ingestion: Drink copious amounts of water (or milk if available). Do not induce vomiting. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Immediately seek medical attention.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point: N/A **Auto-Ignition Temp:** N/A **Flammable Limits:** N/A

Extinguisher Media: Plenty of water and alcohol-resistant foam are effective.

Special Fire Fighting Procedures: Since vapor, generated from burning batteries may make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Accidental Releases: Do not breathe vapors or touch liquid with bare hands (see section 4).

Waste Disposal Methods: Evacuate area. If possible, a trained person should attempt to soak up with absorbent cloth. An Organic Gas Filter Mask or Self-Contained Breathing Apparatus should be worn.

Other: Follow North American Emergency Response Guide (NAERG) #147 for cells involved in an accident, cells that have vented, or have exploded.

SECTION 7 – HANDLING AND STORAGE

Storage: Cells should be stored at room temperature, approx. 21°C (70°F) charged to about 30–50% of capacity. Do not store batteries in high humidity environments for long periods. High Temperature storage will degrade performance.

Precautions: Do not store the cell in places of the high temperature exceeding 35 deg. C or under direct sunlight or in front of a stove. Do not recharge, over discharge, puncture or crush. Please avoid storing the battery in the places where it is exposed to the static electricity to prevent damage to the protection circuit of the battery pack.

Other Conditions: Do not store cells in close proximity of other combustible / flammable materials.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

When handling internal components

Respiratory Protection: Organic Gas Filter Mask, or Self-Contained Breathing Apparatus.

Protective Gloves: Nitrile or PVC, Gloves should be 15 ml (0.015 in), or thicker.

Eye Protection: Chemical Worker Safety Glasses or face shield.

Ventilation To Be Used: Negative pressure chemical fume hood.

Other Protective Clothing & Equipment: Chemical Laboratory Safety Glasses, Gas mask for organic gases, Protective Apron, Acid Resistant Protective Clothing, and face shield.

Hygienic Work Practices: Use good chemical hygiene practice. Do not eat or drink when handling contents. Avoid unnecessary contact.

SECTION 9 – PHYSICAL/CHEMICAL CHARACTERISTICS

Nickel Cobalt Aluminum Type

Component	Material	Formula
Positive Electrode	Lithium Cobalt Nickel Aluminum Oxide	LiCoNiAlO ₂
	Lithium Cobalt Oxide	LiCoO ₂
	Lithium Nickel Cobalt Oxide	LiNiCoO ₂
	Lithium Nickel Manganese Cobalt Oxide	LiNiMnCoO ₂
	Lithium Manganese Oxide	LiMnO ₂
Negative Electrode	Lithium Iron Phosphate	LiFePO ₄
	Graphite	C
Electrolyte	Ethylene Carbonate – Solvent	C ₃ H ₄ O ₃
	Diethyl Carbonate – Solvent	C ₅ H ₁₀ O ₃
	Lithium Hexafluorophosphate – Salt	LiPF ₆

SECTION 10 – STABILITY AND REACTIVITY

Stability: Stable **Incompatibility:** N/A **Hazardous Polymerization:** Will not occur.

Since batteries utilize a chemical reaction they are actually considered a chemical product. As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

Conditions to Avoid: Temperatures above the maximum rated temperature as specified by the manufacturer due to leak hazard. High humidity for extended periods.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity (as applicable): Oral (rat) LD50 >2g/kg (estimated)

Irritation: Irritating to eyes and skin.

Mutagenicity: Not specified.

Chronic toxicity: Not specified.

SECTION 12 – ECOLOGICAL INFORMATION

Aquatic Toxicity: Do not let internal components enter marine environments. Avoid releases into waterways, wastewater or groundwater.

SECTION 13 – DISPOSAL CONSIDERATIONS

Proper Shipping Name: Waste Lithium Ion Batteries

UN Number: 3480

Hazard Classification: Class 9 (Misc.)

Packing Group: II

Labels Required: MISCELLANEOUS, HAZARDOUS WASTE

Waste Disposal Code: D003

Other: All lithium ion batteries should be disposed of by a certified hazardous waste disposal facility.

SECTION 14 – TRANSPORT INFORMATION

US DOT (per 49 CFR 172.101) and IATA/ICAO

Proper Shipping Name: Lithium Ion Batteries

UN Number: UN 3480 (UN 3481 for *Lithium Ion Batteries in Equipment*)

Hazard Classification: Class 9 (Misc.)

Packing Group: II

Labels Required: MISCELLANEOUS HAZARD CLASS 9

Other: Lithium ion batteries identified by manufacturer as being defective for safety reason, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport(e.g. those being returned to the manufacturer for safety reasons).

Shipping Requirements:

DOT: Lithium Ion batteries and cells are subject to shipping requirements exceptions under 49 CFR 173.185.

IATA: Shipping procedures for lithium Ion batteries in aircrafts are regulated by the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) requirements in Packing Instructions 965-967.

UN – Recommendations on the Transport of Dangerous Goods and the UN Manual of Tests and Criteria.

SECTION 15 – Regulatory Information

OSHA Status: This product is considered an "Article" and is exempt under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1920.1200.

DOT: Lithium Ion batteries and cells are subject to testing requirements listed 49 CFR 173.185.

TDG: Lithium Ion batteries and cells are subject to testing requirements listed in Schedule 2, special provision 34.

IATA: lithium Ion batteries in aircraft are regulated by the International Civil Aviation Organization (ICAO) and the International Air Transport Association.

UN – Recommendations on the Transport of Dangerous Goods and the UN Manual of Tests and Criteria. Lithium Ion Batteries must be of the type proven to have met the requirements of the Manual of Tests and Criteria section 38.3 prior to being offered for air transport.

SECTION 16 – OTHER INFORMATION

NFPA RATING

For cells or battery packs involved in an accident, cells that have vented, or exploded, follow the North American Emergency Response Guide (NAERG) #147.

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