



Excell Battery Corporation  
18525 53<sup>rd</sup> 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

## MATERIAL SAFETY DATA SHEET

### SECTION 1 – IDENTIFICATION

Product Name: LITHIUM ION RECHARGEABLE BATTERY (OR, LITHIUM ION SECONDARY BATTERY)  
Model Number: 2EXL7431

### SECTION 2 – COMPOSITION, INFORMATION ON INGREDIENTS

The chemical ingredients are contained in a sealed case designed to withstand temperatures and pressures encountered during normal use. The battery should not be opened, disassembled, crushed, burned, or exposed to high temperatures because exposure to the following materials could be harmful under some circumstances. The following information is provided for the user's information only.

Chemical Ingredients	Weight %	CAS Number
Transition Metal Oxide Similar chemical properties to Lithium cobalt dioxide	20-50	Similar chemical properties to 12190-79-3
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Graphite	10-30	7782-42-5
Organic Electrolyte Solvent – Proprietary Similar chemical properties to Ethylene carbonate	10-20	Similar chemical properties to 96- 49-1
Electrolyte Salt – Lithium hexafluorophosphate	1-3	21324-40-3
Aluminum, Nickel, Copper and inert materials	Remainder	N/A

### SECTION 3 – HAZARDS IDENTIFICATION

**\*\*DANGER\*\*** MAY EXPLODE IN A FIRE, WHICH COULD RELEASE GASES OR SOLVENTS IRRITATING TO THE SKIN AND EYES. IN CASE OF FIRE, USE EXTINGUISHING MEDIA SUITABLE FOR THE MATERIALS BURNING IN THE FIRE.

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:** Skin contact, skin absorption, eye contact, inhalation and ingestion.

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

**Signs and Symptoms of Exposure:** The contents of the battery are contained within a sealed can and under routine handling and use and will have no effect.

### SECTION 4 – FIRST AID MEASURES

**Eye Contact:** Check for and remove any contact lenses. 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:** Remove contaminated clothes and shoes. Wash area thoroughly with soap and water and seek medical attention. If appropriate procedures are not taken, this may cause sores on the skin.

**Inhalation:** Leave area immediately and seek medical attention.

**Ingestion:** Wash mouth with water. Drink milk/water and do not induce vomiting; 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. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear. Use extinguishing media suitable for the materials that are burning. If possible, remove Cell from firefighting area. If heated above 150 °C, Cell may explode.

### SECTION 6 – ACCIDENTAL RELEASE MEASURES

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

**On Land:** Place material into suitable containers and call local fire/police department.

**In Water:** If possible, remove from water and call local fire/police department.

### SECTION 7 – HANDLING AND STORAGE

**Handling:** No special protective clothing required for handling an individual battery.

**Storage:** Store in a cool, dry place.

**Special Firefighting Instructions:** If possible, remove Cell from firefighting area. If heated above 150°C, Cell may explode.

**Firefighting Equipment:** Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

## SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Controls:** Keep away from heat and open flame. Store batteries in a cool dry place.

**Personal Protection:** Respirator not required during normal operations. SCBA required in the event of a fire.

**Eye/face protection:** Not required beyond safety practices of employer.

**Gloves:** Not required for handling of cells.

**Foot protection:** Steel toed shoes recommended for large container handling.

## SECTION 9 – PHYSICAL/CHEMICAL CHARACTERISTICS

State	Solid
Odor	N/A
pH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

## SECTION 10 – STABILITY AND REACTIVITY

**Reactivity:** None

**Incompatibilities:** None during normal operation. Avoid exposure to heat, open flame and corrosives.

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

**Hazardous Decomposition Products:** None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

**Conditions to Avoid:** Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

## SECTION 11 – TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling and use.

Sensitization	Teratogenicity	Reproductive Toxicity	Acute Toxicity
NO	NO	NO	NO

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

## SECTION 12 – ECOLOGICAL INFORMATION

Some materials within the cell are bio accumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

## 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**

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**OSHA hazard communication standard (29 CFR 1910.1200):** Non-hazardous

**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**

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Under normal use this product poses no exposure risk. In the event that internal contents of lithium ion cell are released due damage or severe heating, then precautions should be taken to avoid any exposure and properly trained safety personnel should be contacted for cleanup and disposal.

### **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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