

## Material Safety Data Sheet(MSDS)

### 1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product : Lithium Carbon Monofluoride Batteries (Li/CFx Batteries)

1.2 Model : All BR-Type, R-Type and JR-Type Batteries

(BR535, BR435, BR425, BR322, BR311, BR309, BR211, R435, R327, JR435, JR311, etc.)

1.3 Company

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### 2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredient	Content(%)	CAS No.
Lithium Metal(Li)	2	7439-93-2
Carbon Monofluoride (CFx)	10	51311-17-2
Propylene Carbonate (PC)	7	108-32-7
1,2-Dimethoxyethane (DME)	9	110-71-4
Lithium Tetrafluoroborate (LiBF <sub>4</sub> )	1	14283-07-9
Others (Al-CAN, STS-PIN, LED, etc)	71	

### 3. HAZARD IDENTIFICATION

The Lithium Carbon Monofluoride Batteries described in this MSDS are not hazardous when used according to the recommendations of the manufacturer.

Under normal condition of use of the batteries, the electrode materials and the liquid electrolyte they contained are non-reactive provided the battery integrity is maintained.

Risk of exposure exists only in case of mechanical, electrical or thermal abuse.

Thus, the batteries should not short circuit, recharge, puncture, incinerate, crush, immerse in water, force discharge, or expose to above the temperature range of the cell.

In this cases, there is risk of fire or explosion.

## **4. FIRST AID MEASURES**

### 4.1 Skin and eyes

Do not pick up a shorting battery as it may cause a burn. Lithium reacts with moisture, do not pick up a damaged or hot battery without proper hand protection.

Get immediate medical attention when eyes may have been exposed to battery contents from a ruptured battery.

### 4.2 Swallowing

Keep pin type lithium batteries out of the reach of small children. Pin type lithium batteries can be accidentally ingested. If ingested, these batteries may leak harmful contents causing chemical burns, perforation of soft tissue, and in severe cases may cause death. Lithium batteries must be removed immediately if swallowed. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

As with any fire, wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products. Water will cool the fire but may react with available lithium in the batteries producing flammable hydrogen.

Lith-X is effective on fires involving a few lithium batteries.

If the cells are directly involved in a fire, do not use water, CO<sub>2</sub>, HALON extinguishers.

## **6. ACCIDENTAL RELEASE MEASURES**

Do not breathe vapours or touch liquid with bare hand. If the skin has come into contact with the electrolyte, take an action in accordance with 4. FIRST AID MEASURES.

## **7. HANDLING AND STORAGE**

7.1 Handling : Prevent short circuit and do not use the battery above the temperature rating of battery. Do not recharge, force over-discharge, puncture and compress.

7.2 Storage : Storage preferably in cool(below 30°C) and non-elevated temperatures place.

Storage in high temperatures can result in shortened battery life and degrade performance.

Do not store batteries in high humidity, shock and vibration environments.

## **8. EXPOSURE CONTROLS & PERSONAL PROTECTION**

Respiratory protection : Not Applicable

Ventilation : Not Applicable

Protective gloves : Not Applicable

Eye protection : Not Applicable

Other protective clothing : Not Applicable

## **9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance : Cylindrical(or pin) shape

Odor : Odorless

Boiling Point : Not Applicable

Vapor Pressure(mmHg at 25°C) : Not Applicable

Vapor Density(Air=1) : Not Applicable

pH : Not Applicable

Plash Point : Not Applicable

Solubility in Water : Not Applicable

Physical State : Solid

## **10. STABILITY AND REACTIVITY**

Product is stable under conditions described in Section 7(HANDLING AND STORAGE).

Conditions to avoid : Heating and incineration above 90°C, transformation, compression, puncture, disassembly, charge, a short circuit, storage in high humidity for a long time.

Materials to avoid : Prevent to contact Oxidizer, water.

Harmful materials caused by disassembly : Water reacts with lithium metal to form powder such as Lithium hydroxide(LiOH), Lithium Oxide(LiO<sub>2</sub>) and hydrogen gas(H<sub>2</sub>).

## **11. TOXICOLOGICAL INFORMATION**

Symptoms and signs : None, unless battery ruptures. In the event of exposure to internal contents, fumes will be irritating to skin and eyes.

Inhalation : Lung irritant

Skin contact : Skin irritant

Eye contact : Eye irritant

## **12. ECOLOGICAL INFORMATION**

When properly used or disposed the battery does not present environmental hazard.

Cells of JNJ do not contain mercury, cadmium, lead and chrom which has a bad influence on environment.

## **13. DISPOSAL CONSIDERATIONS**

Do not incinerate or subject cells to temperatures in excess of 85°C. In the event of such abuse can result in loss of seal that causes explosion.

Cells should be separated after use in order to prevent short circuit thermal by using tape or other tools and dispose of in accordance with regulations.

## **14. TRANSPORTATION INFORMATION**

### **IATA / ICAO / DOT**

Shipping Name : Lithium Metal Batteries

UN Number : UN3090

Lithium Content : Depends on specific cell.

Packing Group : II (Depends on lithium content and total package weight)

Labels Required : Lithium Metal Batteries, Cargo Aircraft Only - Depends on lithium content and weight - See IATA DGR and lithium content information

### **ADR / RID / IMDG Surface Transportation**

- Cell and batteries must meet the requirements of UN Manual of Test and Criteria, Part III, Sub-section 38.3.
- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery. To provide protection from damage or compression to the batteries, the inner packagings must be placed in a strong rigid outer packagings of one of the packaging types shown below.
- Each package must be capable of withstanding a 1.2m drop test in any orientation without; 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.
- Each consignment must be accompanied with a document with an indication that; The package contains Lithium metal cells or batteries.
- The package shall 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;
- A telephone number of more information.
- Each package must be labelled with a lithium battery handling label and the Cargo Aircraft Only label.
- The words "Lithium metal batteries in compliance with Section II of PI 968" must be included on the air waybill, when an air waybill is used.
- Individual packages each complying with the requirements of Section II may be placed in an overpack.
- The following regulations are cited and considered:



<Lithium battery handling label>



<Cargo Aircraft Only label>

**Lithium content per Cell Type**

Item	Lithium wt.(g)
BR535	0.03
BR435	0.020
BR425	0.011
BR322	0.008
BR311	0.004
BR309	0.002

Item	Lithium wt.(g)
BR211	0.002
R435	0.015
R327	0.008
R316	0.004
JR435	0.020
JR311	0.004

**15. REGULATORY INFORMATION**

None.

**16. OTHER INFORMATION**

Environmental Health & Safety Information : +82-31-798-0440

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Approved by : Lee JongSang

Notice: The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. JNJCompany makes no warranty expressed or implied.