



## MATERIAL SAFETY DATA SHEET

Date: Jan 8, 2013

File No.: PH-W5-875

F

---

### 1. Identification of the substance/preparation and of the company/undertaking

---

#### Identification of the product

Product name: Lithium Metal Cell  
Chemical System: Lithium and Manganese Dioxide (Li-MnO<sub>2</sub> cells )  
Model: Cylindrical and coin Type Cells\_  
Designated for 'DO NOT RECHARGE'?  Yes \_\_\_ No

#### Manufacturer/supplier identification

Company:  
Contact for information:  
Emergency telephone No.:

---

### 2. Composition/information on ingredients

---

Ingredient	Percent	CAS Index No./EC No.	Molar mass	Molecular formula	Symbol
Manganese Dioxide	33%	1313-13-9		MnO <sub>2</sub>	
Lithium	2.4%	7439-93-2		Li	
Propylene carbonate	6.25%	108-32-7		PC	
Dimethyl ether	6.25%	115-10-6		DME	
Lithium Perchlorate	1.4%	7791-03-9		LiClO <sub>4</sub>	
Polypropylene	2.1%	9003-07-0		PP	
Steel	47.2%	7439-89-6		Fe	
Aluminum	1.4%	7429-90-5		Al	

Remark: The weight of metallic lithium per cell is <1.0 g.

---

### 3. Hazards identification

---

Routes of Entry:

Inhalation - Yes  
Skin - Yes  
Ingestion – Yes

**Health Hazards (Acute and Chronic):**

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is an acute exposure when the gas release vent works. Organic solvent has slight toxicity and can irritate skin and eyes. Lithium salt is irritating to skin, eyes and mucous membranes and should be avoided.

**Carcinogenicity:**

NTP: None IARC Monograph: None OSHA Regulated: None

**Medical Conditions Generally Aggravated by Exposure:**

An acute exposure will not generally aggravate any medical condition.

---

#### **4. First aid measures**

---

After skin contact:	In case of skin contact with contents of battery, flush immediately with water. If irritation persists, get medical help.
After eye contact:	For eye contact, flush with copious amounts of water for 15 minutes. Do not inhale leaked material. If irritation persists, get medical help.

---

#### **5. Fire-fighting measures**

---

Extinguishing Media: CO2 or dry chemicals  
Flammable Limits: Not available

---

#### **6. Accidental release measures**

---

The preferred response is to leave the area and allow the batteries to cool and the vapors to dissipate. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

---

#### **7. Handling and storage**

---

Avoid mechanical or electrical abuse. Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

---

#### **8. Exposure controls/personal protection**

---

Specific control parameter:  
Personal protective equipment :

Respiratory protection (Specify Type):	Not necessary under conditions of normal use.
Ventilation:	Not necessary under conditions of normal use.
Protective Gloves:	Not necessary under conditions of normal use.
Eye protection:	Not necessary under conditions of normal use.
Other Protective (Clothing or Equipment):	Not necessary under conditions of normal use.

---

## 9. Physical and chemical properties

---

**Specific Gravity:** (H<sub>2</sub>O=1): MnO<sub>2</sub>: 5.03

**Melting Point:** (°C): MnO<sub>2</sub> decomposes at 535 deg. C

MnO<sub>2</sub> is a black, odorless powder.

Lithium is a soft, silvery metal.

Organic solvent is an odorless, colorless or light yellow liquid.

Lithium salt is a white, crystalline and odorless powder.

---

## 10. Stability and reactivity

---

Stability: Stable

Conditions to Avoid: Do not heat, disassemble or charge.

Hazardous Decomposition or By-products: N/A

Hazardous polymerization will not occur.

---

## 11. Toxicological information

---

Acute toxicity:

Organic solvent

Further toxicological information:

Lithium

---

## 12. Ecological information

---

Ecotoxic effects: N/A

Further ecological data: N/A

---

## 13. Disposal considerations

---

MaxPowerCell encourages battery recycling. Our Li-Mn batteries are recyclable through the Rechargeable Battery Recycling Corporation's (RBRC) *Charge Up to Recycle! Program*. For information call 1-800-8-BATTERY or see their website at [www.rbrc.org](http://www.rbrc.org). Li-Mn batteries must be handled in accordance with all applicable state and federal laws and regulations.

DO NOT RECHARGE, disassemble, short, or subject battery cells to temperatures in excess of 212 F. Do not use in combination with fresh and used lithium batteries neither with other type of battery.

---

#### **14. Transport information**

---

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for MaxPowerCell lithium batteries are compliant with these regulatory concerns.

MaxPowerCell lithium manganese dioxide batteries are exempt from the classification as dangerous goods as they meet the requirements of the special provisions listed below. (Essentially, they are properly packaged and labeled, contain less than 1 gram of lithium and pass the tests defined in UN model regulation section 38.3).

International transport regulations	Special Provisions
ADR	188, 230, 310, 636, 656
IMDG	188, 230, 310, 957
UN	UN 3090, UN 3091
US DOT	29, A54, A100, A101
IATA, ICAO	Packaging Instructions 968 - 970

---

#### **15. Regulatory information**

---

N/A

---

#### **16. Other information**

---

<b>Make people:</b>	Professional post:R&D Engineer	Name(sign):
<b>Make unit:</b>	Name:R&D Department	Phone:
	Address:R&D Dept.,	

**Date of issue:**2013/01/08

**DISCLAIMER:** **The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. MaxPowerCell LLC Energy &Technology Co. Ltd makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.**