Gillette
Environment
Health and Safety

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MATERIAL SAFETY DATA SHEET

NAME: **DURACELL LITHIUM MANGANESE DIOXIDE BATTERIES**

CAS NO: Not applicable **Effective Date:** 4/4/05 **Rev:** 9

A. — IDENTIFICATION

	%
Manganese Dioxide (1313-13-9)	30-45
1,2-Dimethoxyethane (110-71-4)	5-10
Propylene Carbonate (108-32-7)	1-10
Lithium (7439-93-2)	1-5
Carbon Black (1333-86-4)	1-5
Lithium Trifluoromethane Sulfonate (33454-82-9)	1-5
Ethylene Carbonate (96-49-1)	0-5

Formula: Mixture — Mixture

Molecular Weight: NA

Synonyms: Lithium Manganese Dioxide Cells: DL2/3A; DL123A(3V); DL223A(6V); DL245 (6V); DL323A (9V); DLCR2; PL123 ; CR-V3P (3V); batteries comprised of DL2/3A cells, and DLP533570.

B. — PHYSICAL DATA

Boiling Point: NA °F NA °C	Melting Point: NA °F NA °C	Freezing Point: NA °F NA °C
Specific Gravity (H_2O=1): NA	Vapor Density (air=1): NA	Vapor Pressure @ ____ °F: NA mm Hg
Evaporation (Ether =1): NA	Saturation in Air (by volume@ ____ °F): NA	Autoignition Temperature: ____ °F ____ °C: NA
% Volatiles: NA	Solubility in Water: NA	pH: NA

Appearance/Color: Small cylindrical batteries. Contents dark in color.

Flash Point and Test Method(s): 1,2-Dimethoxyethane 42.8 °F, 6°C (Closed Cup)

Flammable Limits in Air (% by volume): Lower NA % Upper NA %

C. — REACTIVITY

Stability		Polymerization		
[X] stable	[ ] unstable	[ ] may occur	[X] will not occur	

Conditions to Avoid

Do not heat, crush, disassemble, short circuit or recharge.

Conditions to Avoid

Not applicable

Incompatible Materials

Contents incompatible with strong oxidizing agents.

Hazardous Decomposition Products

Thermal degradation may produce hazardous fumes of manganese and lithium; hydrofluoric acid; oxides of carbon and sulfur and other toxic by-products.

*** IF MULTIPLE INGREDIENTS, INCLUDE CAS NUMBERS FOR EACH** **NA=NOT AVAILABLE**

Footnotes

Not applicable

D. — HEALTH HAZARD DATA

Occupational Exposure Limits PEL's, TLV's, etc.)

8-Hour TWAs: Manganese Dioxide (as Mn) - 5 mg/m^3 (Ceiling) (OSHA); 0.2 mg/m^3 (ACGIH/Gillette)

1,2-Dimethoxyethane - 0.15 ppm (Gillette)

Carbon Black - 3.5 mg/m^3 (OSHA/ACGIH)

Lithium Trifluoromethane Sulfonate - 0.1 mg/m^3 (3M recommendation)

These levels are not anticipated under normal consumer use conditions.

Warning Signals

Not applicable

Routes/Effects of Exposure

These chemicals and metals are contained in a sealed can. For consumer use, adequate hazard warnings are included on both the package and on the battery. Potential for exposure should not exist unless the battery leaks, is exposed to high temperature or is mechanically, physically, or electrically abused.

1. Inhalation — Not anticipated. Respiratory (and eye) irritation may occur if fumes are released due to heat or an abundance of leaking batteries.
2. Ingestion — Irritation to the internal/external mouth area may occur following exposure to a leaking battery.
3. Skin
   a. Contact
   Irritation may occur following exposure to a leaking battery.
   b. Absorption
   Not anticipated.
4. Eye Contact — Irritation may occur following exposure to a leaking battery.
5. Other — Not applicable

E. — ENVIRONMENTAL IMPACT

1. Applicable Regulations — All ingredients listed in TSCA inventory.
2. DOT Hazard Class - — Not applicable
3. DOT Shipping Name - — Not applicable

"DURACELL certifies that all of its lithium batteries meet the requirements of the UN Manual of Tests and Criteria, Part III subsection 38.3. If you assemble these batteries into larger battery packs, it is recommended that you perform the UN Tests to ensure the requirements are met prior to shipment. Cells and batteries are to be separated so as to prevent short circuits and packed in strong packaging, except when installed in equipment. Except when installed in equipment, each package containing more than 24 cells or 12 batteries must be marked indicating that it contains lithium batteries and that special procedures should be followed in the event that the packaging is damaged. In addition, each shipment must be accompanied by appropriate documentation and the package of a type capable of meeting the drop test requirements. Except for personal use, the shipment of lithium batteries aboard passenger aircraft is no longer allowed. The following new marking requirement applies to all lithium battery shipments that are exempted from Class 9 according to CFR49: Primary Lithium Batteries - Forbidden From Transport Aboard Passenger Aircraft". This wording should appear on all packages offered for shipment."

Environmental Effects

These batteries pass the U. S. EPA's Toxicity Characteristic Leaching Procedure and therefore, may be disposed of with normal waste.

F. — EXPOSURE CONTROL METHODS

Engineering Controls

General ventilation under normal use conditions.

Eye Protection

None under normal use conditions. Wear safety glasses when handling leaking batteries.

Skin Protection

None under normal use conditions. Use butyl gloves when handling leaking batteries.

Respiratory Protection

None under normal use conditions.

Other

Keep batteries away from small children.

G. — WORK PRACTICES

Handling and Storage

Store at room temperature. Avoid mechanical or electrical abuse. **DO NOT** short or install incorrectly. Batteries may explode, pyrolize or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag.

Normal Clean Up

Not applicable

Waste Disposal Methods

No special precautions are required for small quantities. Large quantities of open batteries should be treated as hazardous waste. Dispose of in accordance with federal, state and local regulations. Do not incinerate, since batteries may explode at excessive temperatures.

H. — EMERGENCY PROCEDURES

Steps to be taken if material is released to the environment or spilled in the work area

Notify safety personnel of large spills. Evacuate the area and allow vapors to dissipate. Increase ventilation. Avoid eye or skin contact. **DO NOT** inhale vapors. Clean-up personnel should wear appropriate protective gear. Remove spilled liquid with absorbent and contain for disposal.

Fire and Explosion Hazard	Extinguishing Media
Batteries may burst and release hazardous decomposition products when exposed to a fire situation. See Sec. C.	As for surrounding area. Dry chemical, alcohol foam, water or carbon dioxide. For incipient fires, carbon dioxide extinguishers are more effective than water.

Firefighting Procedures

Cool fire-exposed batteries and adjacent structures with water spray from a distance. Use self-contained breathing apparatus and full protective gear.

I. — FIRST AID AND MEDICAL EMERGENCY PROCEDURES

Eyes

Not anticipated. If battery is leaking and material contacts eyes, flush with copious amounts of clear, tepid water for 30 minutes. Contact a physician at once.

Skin

Not anticipated. If battery is leaking, irrigate exposed skin with copious amounts of clear, tepid water for at least 15 minutes. If irritation, injury or pain persists, consult a physician.

Inhalation

Not anticipated. If battery is leaking, contents may be irritating to respiratory passages. Remove to fresh air. Contact physician if irritation persists.

Ingestion

Not anticipated. Rinse the mouth and surrounding area with clear, tepid water for at least 15 minutes. Consult a physician immediately for treatment and to rule out involvement of the esophagus and other tissues.

Notes to Physician

1) Potential leakage of dimethoxyethane, propylene carbonate and lithium trifluoromethane sulfonate.
2) Dimethoxyethane rapidly evaporates.
3) Under certain misuse conditions and by abusively opening the battery, exposed lithium can react with water or moisture in the air causing potential thermal burns or fire.

MATERIAL SAFETY DATA SHEET

MSDS001

Section 1. Chemical Product And Company Identification

Ultralife Part Number:	U9VL; U9VL-FP; U9VL-J; U9VLBUG; U9VLBUG-FP (Lectro)
Description:	Ultralife Lithium Power Cell
Size:	9.6 Volts
Customer Part Number:	N/A
Customer Description:	N/A
National Stock Code:	U9VL: 6135-01-369-9792

Manufactured by	☒**Ultralife Batteries, Inc.**	
	2000 Technology Pkwy	
	Newark, NY 14513-2175	
CAGE Code	**0UU59**	

Emergency Telephone Number:	**Chemtrec for Spills, Leaks, Fires**
USA	**1-800-424-9300**
International	**703-527-3887**
Technical Contact Telephone Number:	**1-800-332-5000**

Section 2. Composition/Information on Ingredients

Chemical Name	CAS #	Exposure Limits	Percent of Content
Manganese Dioxide, MnO_2	1313-13-9	None Listed	35 – 40
Lithium Metal, Li	7439-93-2	None Listed	1 – 4
Propylene Carbonate, $C_4H_6O_3$	108-32-7	None Listed	8 – 10
1,3-Dioxolane, $C_3H_6O_2$	646-06-0	None Listed	5 – 9
Lithium Hexafluoroarsenate, $LiAsF_6$	29935-35-1	As: .01 mg/m^3	1 – 4

Important Note: The materials in this section may only represent a hazard if the integrity of the battery is compromised or if the battery is physically or electrically abused.

Section 3. Hazards Identification

3.1 Emergency overview: May leak and /or flame if opened, recharged, connected improperly, or disposed of in fire.

3.2 Potential health effects: Skin contact may cause irritation and absorption.
Contact with raw lithium may cause burns.
Routes of entry: Inhalation or ingestion of electrolyte may have toxic effects.
Acute exposure: Electrolyte may irritate skin and eyes.
Effects of chronic exposure: Dry Skin

Section 4. First Aid Measures

Electrolyte Contact
- Skin- Immediately flush with plenty of water for at least 15 minutes. If symptoms are present after flushing, get medical attention.
- Eyes- Immediately flush with plenty of water for at least 15 minutes and get medical attention.

Lithium Metal Contact
- Skin- Remove particles of lithium from skin as rapidly as possible. Immediately flush with plenty of water for at least 15 minutes and get medical attention.
- Eyes- Immediately flush with plenty of water for at least 15 minutes and get immediate medical attention.

Section 5. Fire Fighting Measures

Extinguishing Media:
- Copious amounts of cold water are an effective extinguishing medium for lithium batteries. Do not use warm or hot water.
- Do not use Halon type extinguishing material.

Fire Fighting Procedures
- Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire.
- Full protective clothing is necessary.
- During water application, caution is advised as burning pieces of lithium may be ejected from the fire.

Unusual Fire and Explosion Hazards
- Batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat or fire.

Hazardous combustion products
- Fire or excessive heat may produce hazardous decomposition products.
- Damaged or opened batteries can result in rapid heating and the release of flammable vapors. Vapors are heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back.

Section 6. Accidental Release Measures

Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

Section 7. Handling And Storage

Do not store batteries in a manner that allows terminals to short circuit.

Batteries should be separated from other materials and stored in a non-combustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods

Batteries should be stored in a cool (below 70°F), dry area. Air conditioning or cooling is not required unless excessively high temperatures will be encountered. Elevated storage temperatures can result in reduced battery shelf life and service life, and should be avoided. Batteries should be kept as cool as possible in order to maximize shelf life and service life.

Batteries are not designed to be recharged. Charging a battery may result in electrolyte leakage and/ or cause the battery to flame.

Never disassemble a battery.

Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapors that may be emitted.

In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Measures.

More than a momentary short circuit will generally reduce the battery service life. Batteries with fuses will no longer be functional after being shorted.

Extended short circuiting creates high temperatures in the cell. High temperatures can cause burns in skin or cause the cell to flame.

Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.

The use of old and new batteries or batteries of varying sizes and types in the same battery assembly should be avoided. The batteries' electrical characteristics and capabilities vary and damage may result to batteries or electrical equipment.

Section 8. Exposure Controls/Personal Protection

No engineering controls are required for handling batteries that have not been damaged. Personal protective equipment for damaged batteries should include chemical resistant gloves and safety glasses. In the event of a fire, SCBA should be worn along with thermally protective outer garments.

Section 9. Physical And Chemical Properties

Not Applicable

Section 10. Stability And Reactivity

(1) This product is stable under ordinary conditions of use and storage.
(2) It is not recommended that this product be stored above 85°C (194°F).
(3) Damaged batteries will react with water. Non-discharged batteries contain elemental Lithium. This is water reactive. This reaction gives off heat and hydrogen gas. A thermal reaction may occur.
(4) Hazardous decomposition products: Carbon Monoxide (CO), and Hydrogen Flouride (HF)

Section 11. Toxicological Information

(1) Irritancy: The electrolytes contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause irritation.
(2) Sensitization: No information is available at this time.
(3) Carcinogenicity: No information is available at this time.
(4) Reproductive toxicity: No information is available at this time.
(5) Teratogenicity: No information is available at this time.
(6) Mutagenicity: No information is available at this time.

Section 12. Ecological Information

Not applicable to this material/product.

Section 13. Disposal Considerations

Batteries must be completely discharged prior to disposal and/ or the terminals must be taped or capped to prevent short circuit. This product does not contain any materials listed by the United Stated EPA as requiring specific waste disposal requirements. When completely discharged it is not considered hazardous. Disposal of large quantities of lithium power cells may be subject to Federal, State, or Local regulations. Consult your local, state and provincial regulations regarding disposal of these batteries.

Section 14. Transport Information

Ultralife's lithium metal primary cells and batteries and lithium ion cells and batteries are classified and regulated as Class 9 dangerous goods (also known as "hazardous materials" in the United States) by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA), International Maritime Organization (IMO) and many government agencies such as the U.S. Department of Transportation (DOT). These organizations and agencies publish regulations that contain detailed packaging, marking, labeling, documentation, and training requirements that must be followed when offering (shipping) Ultralife's cells and batteries for transportation. **However, small cells and batteries are not subject to certain provisions of the regulations (e.g., Class 9 labeling and UN specification packaging) if they meet specific requirements**. The regulations are based on the UN Recommendations on the Transport of Dangerous Goods Model Regulations and the UN Manual of Tests and Criteria. **These regulations also apply to shipments of cells and batteries that are packed with or contained in equipment.** Failure to comply with these regulations can result in substantial civil or criminal penalties.

Cell and Battery Testing Requirements

The dangerous goods regulations require that each cell and battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport. Ultralife's cells and batteries have been tested and comply with all of the UN testing requirements. **Batteries or battery packs constructed from Ultralife's cells must be subjected to tests contained in the UN Manual of Tests and Criteria.**

Additional Information

UN Recommendations on the Transport of Dangerous Goods Model Regulations

IATA Dangerous Goods Regulations

International Maritime Dangerous Goods Code

European Road Regulations (ADR)

U.S. Hazardous Materials Regulations

For more information, please refer to the Transportation Regulations Page on Ultralife's Web Site:

http://www.ultralifebatteries.com/subcategory.php?ID=12

Product is shipped as:

Ground (DOT/ADR)	Air (IATA/ICAO)	Water(IMDG Code)
May be shipped without being declared as Class 9 dangerous goods.	**May be shipped without being declared as Class 9 dangerous goods.**	**May be shipped without being declared as Class 9 dangerous goods.**
UN specification packaging is not required. No Class 9 label or UN number is required on outer package. In addition, no shipper's declaration for dangerous goods is required.	UN specification packaging is not required. No Class 9 label or UN number is required on outer package. In addition, no shipper's declaration for dangerous goods is required. **These batteries cannot be shipped on passenger aircraft from, to or within the USA.**	UN specification packaging is not required. No Class 9 label or UN number is required on outer package. In addition, no shipper's declaration for dangerous goods is required.

Special shipping information: This battery has been tested to Section 38.3 of 'UN Manual of Tests and Criteria'. The amount of Lithium contained in these batteries is below the limits set by the DOT in Section 49CFR173.185 and IATA A45. There is an exception to ship these with the following shipping label:

LITHIUM BATTERIES
Do not damage or mishandle this package
If package is damaged, batteries must be quarantined, inspected and repacked.
For emergency information, call CHEMTREC
1-800-424-9300 North America
1-703-527-3887 International

These batteries cannot be shipped by passenger aircraft.

Section 15. Regulatory Information

USA: This MSDS meets/exceeds OSHA requirements.
Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
International: This MSDS conforms to European Union (EU), the International Standards Organization (ISO) and the International Labour Organization (ILO) and as documented in ANSI (American National Standards Institute) Standard Z400.1-1993.

Section 16. Other Information

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.