



## MATERIAL SAFETY DATA SHEET

**NAME:** DURACELL LITHIUM ION RECHARGEABLE CELLS  
**CAS NO:** Not applicable **Effective Date:** 08/15/2005 **Rev:** 5

### A. — IDENTIFICATION

	%	Formula: Mixture Mixture
Lithium Cobalt Oxide (12190-79-3)	30-40	Molecular Weight: NA
Mesophase Carbon Microbeads (7440-44-0)	20-25	Synonyms: Lithium Ion Cell for Packs: DR2, DR3, DR4, DR5, DRC1L, DRC412, DRC511, DRC522, DRC915, DRF60, DRF80 , DRJ107, DRJ416, DRJ514, DRNEL1, DRP120, DRP140, DRP220, DRS11, DRS750, DRSC10, DRSM50, DRSM70, DRSM90, DRV441
Copper (7440-50-8)	10-15	
Ethylene Carbonate (96-49-1)	5-10	
Dimethyl Carbonate (616-38-6)	5-10	
Aluminum (7429-90-5)	1-5	
Lithium Hexafluorophosphate (21324-40-3)	1-5	
Acetylene Black (1333-86-4)	1-5	

### B. — PHYSICAL DATA

Boiling Point NA °F NA °C	Melting Point NA °F NA °C	Freezing Point NA °F NA °C
Specific Gravity (H <sub>2</sub> O=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** Battery pack with cylindrical batteries. Contents dark in color.

**Flash Point**  
Test Method(s) (Dimethyl Carbonate - approximately 8% of contents) 64.4 °F, 18.0 °C (Closed Cup)

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

### C. — REACTIVITY

Stability <input checked="" type="checkbox"/> stable <input type="checkbox"/> unstable	Polymerization <input type="checkbox"/> May occur <input checked="" type="checkbox"/> will not occur
<u>Conditions to Avoid</u> Do not heat, crush, disassemble or short circuit.	<u>Conditions to Avoid</u> Not applicable
<u>Incompatible Materials</u> Contents incompatible with strong oxidizing agents.	<u>Hazardous Decomposition Products</u> Thermal degradation may produce hazardous oxides of carbon and phosphorous; hydrofluoric acid 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: Lithium Cobalt Oxide as (Co) (Dusts and fumes) - 0.1 mg/m<sup>3</sup> (OSHA); 0.02 mg/m<sup>3</sup> (ACGIH)  
 Copper (Dusts and Mists)- 1.0 mg/m<sup>3</sup> (OSHA/ACGIH);  
 (Fume) - 0.1(OSHA); 0.2 mg/m<sup>3</sup>(ACGIH)  
 Aluminum (Dust) - 15.0 mg/m<sup>3</sup> (OSHA); 10.0 mg/m<sup>3</sup> (ACGIH)  
 Carbon Black - 3.5 mg/m<sup>3</sup> (OSHA/ACGIH)  
 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 temperatures 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.

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 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

The Duracell Rechargeable Recycling Program should be utilized to recycle the battery packs. See battery pack or instructions for a phone number to access the recycling program. Discharged batteries may be disposed of with normal household trash.

**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. Irritating vapors may be released from leaking or ruptured batteries. Avoid eye or skin contact and inhalation of vapors. Increase ventilation. Clean-up personnel should wear appropriate protective gear.

**Fire and Explosion Hazard**

Handle as a flammable liquid. Batteries may burst and release hazardous decomposition products when exposed to a fire situation. See Sec. C.

**Extinguishing Media**

Dry chemical, alcohol foam, water or carbon dioxide. For incipient fires, carbon dioxide extinguishers are more effective than water.

**Firefighting Procedures**

Use self-contained breathing apparatus and full protective gear. Rapidly cool batteries and adjacent structures with water.

**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 at least 30 minutes. Contact 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 mouth and surrounding area with clear, tepid water for a least 15 minutes. Consult a physician immediately for treatment and to rule out involvement of the esophagus and other tissue.

**Notes to Physician**

- 1) Potential leakage of less than 1 gram of ethylene carbonate, dimethyl carbonate and lithium hexafluorophosphate.
- 2) The carbonates are volatile leaving a residue of lithium hexafluorophosphate which is an eye and skin irritant and caustic material.
- 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.

Replaces #2029.3 Revision of product numbers, Section E.

Also valid for discontinued product numbers: DR201; DR202; DR224; DR225; DR250; DR610; DR820 (battery packs)

The information contained in the Material Safety Data Sheet is based on data considered to be accurate, however, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof.