

# MATERIAL SAFETY DATA SHEET / SAFETY DATA SHEET

SECTION I – PRODUCT AND COMPANY IDENTIFICATION						
Product Description	CELL, LiMn02, U2560	CELL, LiMn02, U2560				
Product Identification	220470, U10021, U10022, U10023, U10024, S00153, S00197					
Manufacturer	Ultralife Corporation	24 Hour	ChemTrec			
Name/Address	2000 Technology Parkway Emergency 800-424-9300 (US)		800-424-9300 (US)			
	Newark, NY 14513	Contact	703-527-3887 (International)			
Technical Contact	800-332-5000	Issue Date	02 MAY 01			
Prepared By	John Diggory	Revision Date:	22 OCT 10			

Section II - HAZARD IDENTIFICATION				
Hazard	This Ultralife battery product meets the definition of an article. Under the			
Classification	Globally Harmonized System of Classification and Labeling of Chemicals			
	(GHS), "Articles" as defined in the Hazard Communication Standard (29 CFR			
	1910.1200) of the Occupational Safety and Health Administration of the United			
	States of America, or by similar definition, are outside the scope of the system.			
	[Rev. 2 (2007) Part 1.3.2.1.1]			
Hazard/Caution	Do not open or disassemble.			
Statements	Do not expose to fire or open flame.			
	• Do not mix with batteries of varying sizes, chemistries or types.			
	• Do not puncture, deform, incinerate or heat above 85°C (194 °F).			
The materials contained in this product may only represent a hazard if the integrity of the				
cell or battery is compromised; physically or electrically abused.				

### SECTION III - COMPOSITION - INGREDIENTS/IDENTITY INFORMATION

Under normal use conditions, cells and batteries do not emit hazardous or regulated substances. CAS Number EINECS Number Component % by Wt. Manganese Dioxide, MnO<sub>2</sub> 215-202-6 40-45 1313-13-9 Lithium Metal, Li 7439-93-2 231-102-5 3-4 Propylene Carbonate, C<sub>4</sub>H<sub>6</sub>O<sub>3</sub> 108-32-7 4-5 203-572-1 Ethylene Glycol Dimethyl Ether 110-71-4 203-794-9 3-4 (1,2-Dimethoxyethane),  $C_4H_{10}O_2$ Tetrahydrofuran, C<sub>4</sub>H<sub>8</sub>O 109-99-9 203-726-8 5-9 232-237-2 Lithium Perchlorate, LiClO<sub>4</sub> 7791-03-9 1 Depending on product configuration, components used to assemble battery packs (e.g. housings, electronic components and wiring) may contain additional hazardous materials, such as lead solder.

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT

<b>SECTION IV</b>	- FIRST AID MEASURES
	Avoid inhaling any vented gases.
Inhalation	Remove to fresh air immediately.
	If breathing is difficult, seek emergency medical attention.
Ingestion	Consult a physician or local poison control center immediately
Skin Contact	• Exposure to materials from a ruptured or otherwise damaged cell or battery may
	cause skin irritation.
	• Flush immediately with water and wash affected area with soap and water.
Eye Contact	Exposure to materials from a ruptured or otherwise damaged cell or battery may
	cause eye irritation.
	• Flush immediately with copious amounts of water for at least 15 minutes; consult a
	physician immediately.

SECTION V - FIRE FIGHTING MEASURES				
Extinguishing	Copious amounts of cold water or water-based foam may be used to cool burning			
Media	cells or batteries. Do not use warm or hot water.			
	• A carbon dioxide (CO <sub>2</sub> ) extinguisher is also effective.			
	• For fires involving exposed, raw lithium metal (characterized by deep red flames),			
	use only metal (Class D) fire extinguishers.			
Special Fire	• Use a positive pressure self-contained breathing apparatus (SCBA) if cells or			
Fighting	batteries are involved in a fire.			
Procedures	Full fire fighting protective clothing is necessary.			
	• During water application, caution is advised as burning pieces of flammable			
	particles may be ejected from the fire.			
Unusual Fire	Calle or betteries that are demograd, append or exposed to exercise best/fire may			
and Explosion	flame or look potentially bezerdeup organic venero			
Hazard	name of leak potentially hazardous organic vapors.			

# SECTION VI - ACCIDENTAL RELEASE MEASURES

- In the event a cell or battery is crushed; releasing its contents, rubber gloves must be used to handle all battery components.
- Avoid inhalation of any vapors that may be emitted.
- Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

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SECTION VII - HANDLING AND STORAGE				
Precautions for	• Batteries are not designed to be recharged. Charging a primary cell or battery			
Safe Handling	may result in electrolyte leakage and/or cause the cell or battery to flame.			
	Never disassemble a battery or bypass any safety device.			
	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.			
	Note: Contains a perchlorate material – special handling may apply.			
	See www.dtsc.ca.gov/hazardouswaste			
Conditions for	• Batteries should be separated from other materials and stored in a			
Safe Storage	non-combustible, well ventilated structure with sufficient clearance between			
and	walls and battery stacks. Do not place batteries near heating equipment,			
Incompatibility	nor expose to direct sunlight for long periods.			
	• Do not store batteries above 85°C (194°F) or below 20°C (-4°F). Store			
	batteries in a cool (below 25°C (77°F)), dry area that is subject to little			
	temperature change. Elevated temperatures can result in reduced battery			
	service life. Battery exposure to temperatures in excess of 130°C (266°F)			
	will result in the battery venting flammable liquid and gases.			
	• Do not store batteries in a manner that allows terminals to short circuit.			

SECTION VIII: EXPOSURE CONTROLS / PERSONAL PROTECTION			
Engineering	• Under conditions of normal use, batteries do not emit hazardous or regulated		
Controls and	substances.		
Work Practices	No engineering controls are required for handling batteries that have not been		
	damaged.		
Personal	Personal protective equipment for damaged batteries should include chemical		
Protective	resistant gloves and safety glasses.		
Equipment	• In the event of a fire, SCBA should be worn along with thermally protective outer		
	garments.		

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SECTION IX. PHYSICAL AND CHEMICAL PROPERTIES					
Appearance	Cylindrical cell or pack	UEL/LEL	Not Applicable		
Odor	None	Vapor Pressure	Not Applicable		
Odor Threshhold	Not Applicable	Vapor Density	Not Applicable		
рН	Not Applicable	Relative Density	Not Available		
Melting Point	Not Available	Solubility	Not Applicable		
Boiling Point	Not Available	Partition Coefficient	Not Applicable		
Flash Point	Not Applicable	Auto-ignition Temperature	Not Available		
Evaporation Rate	Not Applicable	Decomposition Temperature	Not Available		
Flammability	Not Applicable	Viscosity	Not Applicable		

SECTION X. STABILITY AND REACTIVITY				
Stability	Stable		Hazardous Polymerization	Will Not Occur
Conditions to Avoid		It is not recommended that this product be stored above 85°C (194°F).		
Hazardous Decomposition Carbon Monoxi		noxide (CO), Hydrogen Chloride (	(HCI) and other VOC's	

### SECTION XI – TOXICOLOGICAL INFORMATION

- No toxicological impacts are expected under normal use conditions.
- The electrolytes contained in this cell or battery can irritate eyes with any contact.
- Prolonged contact of electrolytes with lung tissue, skin or mucous membranes may cause irritation.
- The electrolytes contained in this cell or battery contain Ethylene Glycol Dimethyl Ether (EGDME). According to the manufacturer of the electrolyte, teratogenic effects have been demonstrated to occur causing birth defects and reversible testicular and sperm damage in compounds like EGDME and other glycol ethers. There may be particular risk for women of child bearing potential regarding this compound. Exposure to vapors or mists should be avoided, especially for women of childbearing potential.
- The electrolytes contained in this cell or battery contain Tetrahydrofuran (THF). According to the manufacturer of the electrolyte, this compound has been proven to show carcinogenic activity in the liver and kidneys of laboratory animals.
- Detailed information regarding sensitization, carcinogenicity, mutagenicity or reproductive toxicity related to internal cell or battery components has not been included in this document.

#### **Carcinogen References**

National Toxicology Program (NTP): Yes (THF) IARC Monographs: No OSHA: No



#### SECTION XII – ECOLOGICAL INFORMATION

- No ecological impacts expected under normal use conditions.
- Detailed information regarding the ecological impact of internal cell or battery components has not been included in this document.

#### SECTION XIII. DISPOSAL CONSIDERATIONS

Do not dispose in fire. Battery disposal regulations vary on national, state/provincial and local bases. **Disposal must be conducted in accordance with the applicable regulations.** 

These batteries contain recyclable materials and recycling is encouraged over disposal.

#### SECTION XIV. TRANSPORTATION 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.

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..

Approved, production level cells and batteries manufactured and assembled by Ultralife have been tested to Section 38.3 of the UN Manual of Tests and Criteria and passed T1 through T8.

Batteries or battery packs constructed by other parties using Ultralife's cells must be subjected to the tests contained in Section 38.3 of the UN Manual of Tests and Criteria.

#### Important Note Regarding Prototype Cells and Batteries

As a member of PRBA (The Rechargeable Battery Association) Ultralife is permitted to ship prototype cells and batteries as Class 9 hazardous materials/dangerous goods in accordance with the requirements contained in Approval #CA2003030003; provided by the US DOT Research and Special Programs Administration. Recipients of these shipments are prohibited from reshipping unless they are also PRBA members.

For more detailed information, refer to the Transportation Regulations Page on Ultralife's website.



# SECTION XIV. TRANSPORTATION INFORMATION (continued)

UN 3090, Lithium metal batteries		
UN 3091, Lithium metal batteries, contained in equipment		
UN 3091, Lithium metal batteries, packed with equipment		
as above on the Bill of Lading (or other shipping		
documentation) and properly packaged with their terminals protected from short circuit.		

Air shipments of lithium metal cells and batteries must be packed and marked according to IATA/ICAO Packing Instruction 968 (batteries only); 969 (with equipment) or 970 (contained in equipment).

Sea shipments of lithium metal cells and batteries must be packed and marked according to IMDG Packing Instruction P903.

Hazard Class	9	Packing Group	II	Tunnel Code	E
Stowage Location	А	Marine Pollutant	No		

SECTIO	SECTION XV. REGULATORY INFORMATION				
	Hazard Communication Standard (29 CFR 1910.1200)	Article			
	CERCLA SECTION 304 Hazardous Substances	NA			
	EPCRA SECTION 302 Extremely Hazardous Substance	NA			
00	EPCRA SECTION 313 Toxic Release Inventory	Yes			
	EPCRA SECTION 312	NA			
	Components Listed on US Toxic Substances Control Act (TSCA) Inventory	Yes			
	Registration, Evaluation, Authorisation and Restriction of Chemicals	Article			
EU	(REACH)				
	European RoHS Directive 2002/05/EC	Not			
	European Norio Directive 2002/30/20	Applicable			
	European WEEE Directive 2002/96/EC				
	Note: Applies to cells and batteries incorporated into electrical and electronic	See Note			
	equipment, when that equipment becomes waste.				

### SECTION XVI. OTHER INFORMATION

If returning product to any division of Ultralife, consult the relevant regulations regarding handling, packaging, labeling and transportation.

#### <u>Disclaimer</u>

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.

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