RADIANTPOWERCORP A HEICO COMPANY DUKANE SEACOM A HEICO COMPANY RADIANT SEACOM REPAIRS A HEICO COMPANY
7135 16th Street East, Suite 101 Sarasota, FL 34243 PH: (941) 739-3200 Fax: (941) 739-3201

11 February 2021

Subject: Safety Data Sheets (SDS) for Lithium Metal Batteries installed in Dukane Seacom DK-406-[]

To Whom It May Concern:

Dukane Seacom currently uses a non-rechargeable lithium metal battery cell for the DK-406-[]. All cells have passed testing required by UN38.3 standards. The DK-406-[] contains a single battery cell.

When transporting the ELT, they should be packaged and shipped in accordance with local regulatory requirements or current IATA regulations if shipping by air. Air Carriers may impose restrictions beyond the IATA requirements. Check with your Air Carrier for any additional requirements.

Dukane Seacom ELT Part Number:	DK-406-[]
Dukane ELT Battery Part Number:	690-13802-20
Dukane ELT Battery Replacement Kit Part Number:	690-13827-00
Battery Cell Manufacturer:	Ultralife
Battery Cell Manufacturer Part Number:	U10029
Number of Cells per Battery:	1
Number of Batteries per ELT:	1
Total Li Metal Content per ELT:	3.3 g
Total Battery Weight:	115.8 g
UN Shipping Information when shipping a DK-406-[] unit:	UN3091 PI 970 Section I
UN 38.3 Testing Results:	PASSED

Please refer to additional pages of this document for supplementary safety data sheet specifications and UN38.3 information.

Should you require any additional information, please do not hesitate to contact me at stancey@rpcaero.com or the telephone number listed above.

Sincerely,

Sean Tancey

Sean Tancey

Director of Quality

ULTRALIFE®

ORIGINAL DOCUMENT IF STAMPED IN RED

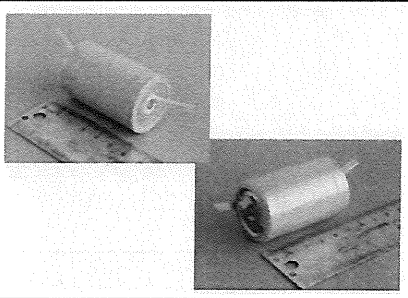
Lithium Battery Test Summary

Lithium Cells or Batteries Test Summary in Accordance with Sub-Section 38.3 of UN Manual of Tests & Criteria

a) Name of Battery Manufacturer	b) Battery Manufacturers Contact Information
Ultralife Corporation	Ultralife Corporation 2000 Technology Parkway Newark, NY 14513 USA Web: www.ultralifecorporation.com Telephone: +1 (800) 332-5000 Email: Orders@ulbi.com
c) Name & Contact Details of Test Laboratory	**d) Test Report Identification Number**
Ultralife Corporation 2000 Technology Parkway Newark, NY 14513 USA Web: www.ultralifecorporation.com Telephone: +1 (800) 332-5000 Email: orders@ulbi.com	UNTR-0049
	e) Date of Test Report
	26 JUN 2017

f) Description of Battery			g) List of Tests Conducted		
Type:	Primary, LiMnO2		T1	Altitude Simulation	PASS
Model:	Multiple, see PN's below.		T2	Thermal Test	PASS
Part Number:	220094, U10013, U10014, U10015, U10016, U10028, U10029, S00120		T3	Vibration	PASS
Brand:	ULTRALIFE BATTERIES		T4	Shock	PASS
Voltage (V) / Capacity (Ah):	3.2V	11.1 Ah	T5	External Short Circuit	PASS
Watt-Hour (Wh) or Lithium Weight (g)	3.3g		T6	Impact / Crush	PASS
Complete Battery Mass (g)	115.8g		T7	Overcharge	NA
Nominal Dimensions (mm)	Diameter 34 x 60		T8	Forced Discharge	PASS

h) Reference to Assembled Battery Testing Requirements	i) Reference to Manual of Tests & Criteria (inc. Amend.)
38.3.3 (f) Not applicable 38.3.3 (g) Not applicable	UN Manual of Tests &Criteria Part III, Subsection 38.3, Lithium Metal &Lithium Ion Batteries, UN ST/SG/AC.10/11/Rev.4 Dated 2003

j) Signature		Image of Battery Pack
	Date: 16DEC2019	
	John Nielsen *(Ultralife Quality Manager)*	

Important! This document remains valid if no changes, modifications, or additions are made to the model(s) described in this document. The model(s) have been classified according to the applicable transport regulations & the UN Manual of Tests & Criteria as of the date of the certification. The model(s) must be packaged, labelled & documented according to country & other international regulations for transportation.

Important! The above signatory / signatories affirm that this document is a true and correct summary of the original individual tests and test data. The original test data is confidential information available to competent State Authorities with valid identification and only upon their formal request. Disclosure of the original test data to any other entity upon its request will be considered by Ultralife and, should Ultralife consider this request is with merit, may be subject to the prior execution of a nondisclosure agreement.

Unique Document Reference: UNTS-0049

SAFETY DATA SHEET

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION			
Product Description Product Identification	Cylindrical Lithium Manganese Dioxide Cells and Batteries (Perchlorate Style)		
Manufacturer Name/Address	Ultralife Corporation 2000 Technology Parkway Newark, NY 14513	24 Hour Emergency Contact	ChemTrec 800-424-9300 (US) 703-527-3887 (International)
Technical Contact	800-332-5000	Issue Date	02 MAY 01
Prepared By	Dave Gould	Revision Date:	15 DEC 20

Section 2 - HAZARDS IDENTIFICATION

NOTE: This Ultralife battery product meets the definition of an article. Under the 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]

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.

GHS Classification

Skin irritation (Category 2)
Skin sensation (Category 1)
Eye irritation (Category 2)
Single target organ toxicity, single exposure (Category 3)
Carcinogen (Category 1B)

GHS Label elements, including precautionary statements

Pictogram

Signal word – DANGER

Hazard statements

H315 Causes skin irritation
H317 May cause an allergic skin reaction
H319 Causes serious eye irritation
H335 May cause respiratory irritation
H350 May cause cancer

Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P302 + P350 IF ON SKIN: gently wash with plenty of soap and water.

P301 + P330 + P331 IF SWALLOWED: rinse mouth, DO NOT induce vomiting.

P304 + P340 IF INHALED: Move person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.

P362 + P352 Take off contaminated clothing and wash before re-use.

P501 Dispose of contents/container in accordance with local/national regulations.

WHMIS Classification

D2A Very toxic material causing other toxic effects

Carcinogen

D2B Toxic material causing other toxic effects

Moderate skin irritant

Skin sensitizer

Moderate respiratory irritant

Moderate eye irritant

OSHA Classification

Hazardous

HMIS Classification

Health Hazard: 2

Chronic Hazards: 0

Flammability: 2

Physical Hazards: 0

Additional Notes:

- Do not open or disassemble.
- 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^{o}C (185^{o}F).

SECTION 3 - COMPOSITION – INGREDIENTS INFORMATION

Under normal use conditions, cells and batteries do not emit hazardous or regulated substances.

Component	CAS Number	EINECS Number	% by Wt.
Manganese Dioxide, MnO_2	1313-13-9	215-202-6	40-45
Lithium Metal, Li	7439-93-2	231-102-5	3-4
Propylene Carbonate, $C_4H_6O_3$	108-32-7	203-572-1	4-5
Ethylene Glycol Dimethyl Ether (1,2-Dimethoxyethane), $C_4H_{10}O_2$	110-71-4	203-794-9	3-4
Tetrahydrofuran, C_4H_8O	109-99-9	203-726-8	5-9
Lithium Perchlorate, $LiClO_4$	7791-03-9	232-237-2	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.

SECTION 4 - FIRST AID MEASURES

Inhalation	• Avoid inhaling any vented gases. • 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 5 - FIRE FIGHTING MEASURES

Extinguishing Media	• Copious amounts of cold water or water-based foam may be used to cool burning cells or batteries. Do not use warm or hot water. • A carbon dioxide (CO_2) extinguisher is also effective. • For fires involving exposed, raw lithium metal (characterized by deep red flames), use only metal (Class D) fire extinguishers. • Do not use Halon type extinguishing material.
Special Fire Fighting Procedures	• Use a positive pressure self-contained breathing apparatus (SCBA) if cells or batteries are involved in a fire. • 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 and Explosion Hazard	• Cells or batteries that are damaged, opened or exposed to excessive heat/fire may flame or leak potentially hazardous organic vapors.

SECTION 6 - 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.

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling	• Batteries are not designed to be recharged. Charging a primary cell or battery 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 cause temporary battery voltage loss until the battery is subjected to a charge. 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** **Go to:** www.dtsc.ca.gov/hazardouswaste
Conditions for Safe Storage and Incompatibility	• Batteries should be separated from other materials and stored in a non-combustible, well ventilated structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods. • Do not store batteries above 60ºC (140ºF) or below -40ºC (-40ºF). Store batteries in a cool (below 25°C (77ºF)), 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 (266ºF) will result in the battery venting flammable liquid and gases. • Do not store batteries in a manner that allows terminals to short circuit.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION	
Engineering Controls and Work Practices	• Under conditions of normal use, batteries do not emit hazardous or regulated substances. • No engineering controls are required for handling batteries that have not been damaged.
Personal Protective Equipment	• 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			
Appearance	Cylindrical Cell pr Pack	UEL/LEL	Not Applicable
Odor	None	Vapor Pressure	Not Applicable
Odor Threshold	Not Applicable	Vapor Density	Not Applicable
pH	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 10 - STABILITY AND REACTIVITY	
Stability:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid:	Prolonged overcharging and/or overheating. It is not recommended that this product be stored above 60°C (140°F).
Hazardous Decomposition:	Carbon Monoxide (CO), and Hydrogen Fluoride (HF)
Reactivity:	Damaged non-discharged batteries contain elemental Lithium that is water reactive. This reaction gives off heat and hydrogen gas

SECTION 11 – 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.
- 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

1. National Toxicology Program (NTP): Yes
2. IARC Monographs: No
3. OSHA: No

SECTION 12 – ECOLOGICAL INFORMATION

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

SECTION 13 - 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 14 - 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
Ultralife Corporation is permitted to ship prototype cells and batteries as Class 9 hazardous materials/dangerous goods in accordance with the requirements contained in a competent authority approval; provided by the US Department of Transportation. Recipients of these shipments are prohibited from reshipping unless they have received a similar approval from the governing Competent Authority.

SECTION 14 - TRANSPORTATION INFORMATION (continued)

Air, Sea and Surface Classification	UN 3090, Lithium metal batteries UN 3091, Lithium metal batteries, contained in equipment UN 3091, Lithium metal batteries, packed with equipment

IATA Packaging Guidance

UN3090 Lithium Metal Batteries:

PI968 Section IA Cells with a lithium metal content in excess of 1 gram and batteries with a lithium metal content in excess of 2 grams.

Section IB Cells with a lithium metal content not more than 1 gram and batteries with a lithium metal content not more than 2 grams.

Section II Cells with a lithium metal content not more than 1 gram and batteries with a lithium metal content not more than 2 grams.

UN3091 Lithium Metal Batteries contained in Equipment:

PI970 Section I Cells with a lithium metal content in excess of 1 gram and batteries with a lithium metal content in excess of 2 grams.

Section II Cells with a lithium metal content not more than 1 gram and batteries with a lithium metal content not more than 2 grams

Lithium Metal Batteries packed with equipment:

PI969 Section I Cells with a lithium metal content in excess of 1 gram and batteries with a lithium metal content in excess of 2 grams.

Section II Cells with a lithium metal content not more than 1 gram and batteries with a lithium metal content not more than 2 grams.

Hazard Class	9	Tunnel Code	E		
Stowage Location	A	Marine Pollutant	No		

SECTION 15 - REGULATORY INFORMATION

US	Hazard Communication Standard (29 CFR 1910.1200)	Article
	CERCLA SECTION 304 Hazardous Substances	NA
	EPCRA SECTION 302 Extremely Hazardous Substance	NA
	EPCRA SECTION 313 Toxic Release Inventory	NA
	EPCRA SECTION 312	NA
	Components Listed on US Toxic Substances Control Act (TSCA) Inventory	Yes
	California Prop 65 Classification	None
EU	Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) 1907/2006	Article
	European RoHS 3 Directive 2015/863/EU	NA
	European WEEE Directive 2012/19/EU Note: Applies to cells and batteries incorporated into electrical and electronic equipment, when that equipment becomes waste.	See Note

SECTION 16 - OTHER INFORMATION

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

Disclaimer

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.