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REV	DESCRIPTION	DATE	DRN	CHK	APR	REL`
A1	Initial Release	01/04/2018	MJ	DAW		

SAFETY DATA SHEET

HIGH ENERGY DENSITY BATTERY (HEDB)

ASSEMBLY 0754A12-002

DRAWN BY	DATE				
M.JENNINGS	2017				
	SIZE	CAGE CODE	DWG NO.	REV	
	A	1MCJ4	0754A12-002_SDS	A1	
	SCALE: N/A		SH 1 OF 9		



As a courtesy to our customers, UEC Electronics has prepared this Product Safety Data Sheet to provide information on its battery products. As defined in OSHA Hazard Communication Standard, Section 1910.1200 (c), UEC batteries are manufactured “articles” which do not result in exposure to hazardous chemicals under normal conditions of use. For this reason Material Safety Data Sheets (MSDS) are not required. The information and recommendations set forth herein are documented for information only and believed to be accurate as of the date of preparation.

Section 1. Product Identification and Company Information

Product Identity	Manufacturer	24 Hour Emergency Contact
Description: Lithium Ion Battery, Rechargeable Model(s): 0754A12-002 Watt Hour Capacity: 1310 Wh Equivalent Lithium Content: 122g Cell Type: LFP	UEC Electronics 5914 Howard Street Hanahan, SC 29410 Phone: (843) 552-8682 Fax: (843) 552-7452	ChemTel Inside US: 1-800-255-3924 Outside US: +01-813-248-0585 Account Number: MSI9165684

Section 2. Hazard Identification

The rechargeable lithium ion batteries described in this safety data sheet are sealed units that are not hazardous when used in accordance with manufacturer recommendations.

Do not short circuit, puncture, incinerate, crush, force discharge, or expose to temperatures above the declared operating temperature range of the product. Doing so runs the risk of fire or explosion.

Under normal conditions of battery use, the electrode materials and liquid electrolyte they contain are not exposed to the external environment provided the battery integrity is maintained and seals remain intact. Mechanical, electrical, or thermal abuse can lead to the activation of safety valves and/or the rupture of battery containers and in such instances, there is risk of personal exposure to internal electrolyte and electrode materials. When battery integrity is compromised, electrolyte leakage, reaction of electrode materials with moisture, or battery vent/explosion/fire may follow depending on the circumstances.



Section 3. Composition and Information on Ingredients

UEC Electronics battery pack products are composed of lithium ion cells, which are typically composed of the following ingredients. Not every ingredient listed below may be present in every cell.

Cell Component	Chemical Name	Percentage	CAS Number
Positive Electrode	Lithium Cobalt Oxide (LCO)	20 – 40 %	1290-79-3
	Lithium Manganese Oxide (LMO)		12057-17-9
	Lithium Iron Phosphate (LFP)		15365-14-7
	Lithium Nickel Cobalt Oxide (NCO)		11306-89-0 12031-55-1
	Proprietary Lithium Nickel Manganese Cobalt Oxide (NMC)		346417-97-8
	Proprietary Lithium Nickel Cobalt Aluminum Oxide (NCA)		193214-24-3
Positive Electrode Current Collector	Aluminum Foil	0.1 – 10%	7429-90-5
Negative Electrode	Carbon Powder	10 – 20 %	7740-44-0
	Graphite		7782-42-5
Negative Electrode Current Collector	Copper Foil	0.1 – 10 %	7740-50-8
Binder	Styrene Butadiene Rubber (SBR)	0 – 3 %	9003-55-8
	Polyvinylidene Fluoride (PVDF)		24937-79-9
Electrolyte Salt	Lithium Hexafluorophosphate	1 – 5%	21324-40-3
	Lithium Tetrafluoroborate		14283-07-9
Electrolyte Solvent	Ethylene Carbonate	5 – 20 %	96-49-1
	Diethylene Carbonate		105-58-8
	Dimethyl Carbonate		616-38-6
	Ethyl Methyl Carbonate		623-53-0
	Propylene Carbonate		108-32-7
Separator	Polyethylene	1 – 3%	9002-88-4
	Polypropylene		9003-07-0
Other	Aluminum, Steel, Nickel and Other Inert Materials	Remainder	N/A



Section 4. First Aid Measures

Under normal conditions of use, batteries are hermetically sealed. However, in case of battery rupture or explosion evacuate personnel from contaminated area and provided maximum ventilation to clear out fumes/gases.

Condition	First Aid Measure
<i>Inhalation</i>	Contents of an open battery can cause respiratory irritation. Inhalation of vapors may cause irritation of the respiratory tract and lungs. Provide fresh air and seek medical attention.
<i>Skin Contact</i>	Contents of an open battery can cause skin irritation, inflammation, and/or chemical burns. Remove contaminated clothing and wash skin thoroughly with water. If a chemical burn occurs or if irritation persists, seek medical attention immediately.
<i>Eye Contact</i>	Contents of an open battery can cause severe irritation and chemical burns. Immediately flush eyes thoroughly with water for at least 15 minutes until no evidence of the chemical remains. Seek medical attention.
<i>Ingestion</i>	Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. If battery or open battery is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

Section 5. Firefighting Measures

In case of fire where a small number of lithium ion batteries are present the affected area should be treated with an extinguishing agent that is appropriate to the situation (water or Class ABC for single cell fires, Class C for electrical fires, etc.).

In case of fire involving many lithium ion batteries, the affected area should be treated with copious amounts of water. This will control the spread of fire and keep adjacent batteries cool.

Fire fighters should wear self-contained breathing apparatus. Burning lithium ion batteries can produce toxic fumes and substances including hydrofluoric acid, oxides of carbon, aluminum, lithium, copper, and cobalt.



Section 6. Accidental Release Measures

Remove personnel from the area until any fumes dissipate. If the skin has been exposed to the electrolyte, it should be washed thoroughly with water as indicated in Section 4.





Utilize proper protective equipment as described in Section 8 (e.g. eye and clothing protection). Sand, earth, or vermiculite should be used to absorb any exuded material.

Seal leaking battery and contaminated absorbent material in plastic bag and dispose of as Special Waste in accordance with local regulations.

Section 7. Handling and Storage

Physical Task	Recommendations
Handling	<p>Do not crush, pierce, or short (+) and (-) battery terminals with conductive (e.g. metal) goods. Do not disassemble, mutilate, puncture, or mechanically abuse cells and batteries. Do not immerse in water.</p> <p>Do not expose battery to extreme temperatures. Avoid direct exposure to extreme heat (e.g. soldering) or fire.</p> <p>Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in nonconductive (i.e. plastic) trays.</p> <p>Do not connect to inappropriate power supplies as this can result in fire or explosion.</p>
Storage	<p>Store in a cool (Preferable between -10°C and 30°C) and ventilated area. Temperature above 70°C may result in battery leakage and rupture.</p> <p>Keep adequate clearance between walls and batteries. Store away from moisture, sources of heat, open flames, oxidizers, food, and drink.</p> <p>Since short circuit can cause burn, leakage, and rupture hazards, keep batteries in original package until use and do not jumble if packaged in bulk containers. Insulate positive and negative terminals and ensure sufficient clearance between batteries and other surfaces to avoid short circuit.</p>
Other	<p>Follow manufacturer's recommendations regarding maximum recommended currents and operating temperature range.</p> <p>Applying pressure or deforming the battery may lead to rupture or leakage which can cause eye, skin, and/or throat irritation.</p>

Section 8. Exposure Controls and Personal Protection

Protection Type		Recommendations
	Respiratory Protection	Not necessary under normal use. In case of battery or cell rupture, use a self-contained full face respiratory mask.
	Hand Protection	Not necessary under normal use. Wear protective rubber gloves if handling a ruptured or leaking battery.
	Eye Protection	Not necessary under normal use. Wear safety goggles if handling a ruptured or leaking battery.
	Other	Not necessary under normal use. Wear a chemical apron or other protective clothing over body if handling a ruptured or leaking battery.

Section 9. Physical and Chemical Properties

Property	Description
Appearance	Small prismatic or cylindrical shape Hermetically sealed Fitted with an external plastic sleeve
Odor	Odorless
pH	Not applicable under normal conditions
Flash Point	Not applicable under normal conditions
Flammability	Organic components will burn if cell is incinerated
Relative Density	> 2% g/cm ³
Solubility (Water)	Not applicable under normal conditions Exposed inner components are insoluble
Solubility (Other)	Not applicable under normal conditions



Section 10. Stability and Reactivity

Property	Description
Stability	Product is stable when handled and stored as specified in Section 7.
Reactivity (Conditions)	Do not heat above 70°C or incinerate, deform, mutilate, crush, pierce, disassemble, or short circuit battery products. Do not expose to humid conditions over a long period.
Reactivity (Materials)	Not applicable under normal conditions.
Hazardous Decomposition Products	Toxic fumes and substances including hydrofluoric acid, oxides of carbon, aluminum, lithium, copper, and cobalt may be released if exposed to fire or extreme heat.

Section 11. Toxicological Information

Condition	Description
Signs & Symptoms	No signs and symptoms unless battery ruptures. In the event of exposure to contents, corrosive fumes will be very irritating to skin, respiratory tract, and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.
Irritation	Risk of irritation only occurs if battery cells are mechanically, thermally, or electrically damaged and the integrity is compromised.
Neurological Effects	No information is available at this time.
Sensitization	Not applicable under normal conditions. The nervous system and organs may be sensitized by exposure to battery contents.
Inhalation	Not applicable under normal conditions. Contents are lung irritants.
Skin Contact	Not applicable under normal conditions. Contents are skin irritants.
Eye Contact	Not applicable under normal conditions. Contents are eye irritants.
Ingestion	Tissue damage to throat and gastro/respiratory tract if swallowed.
Medical conditions generally aggravated by exposure	In the event of exposure to battery contents, eczema, skin allergies, lung injuries, asthma, and other respiratory disorders may occur or be exacerbated if already existing.

Section 12. Ecological Information

Effect Type	Description
Mammalian Effects	None known if used/disposed of correctly.
Eco-toxicity	None known if used/disposed of correctly.
Bioaccumulation Potential	None known if used/disposed of correctly.
Environmental Fate	None known if used/disposed of correctly.
Persistence/Degradability	None known if used/disposed of correctly.
Mobility	None known if used/disposed of correctly.


Section 13. Disposal Considerations

Do not incinerate or subject batteries to temperatures in excess of 70°C. Such abuse can result in loss of seal, leakage, and/or cell explosion.

Prior to disposal battery should be fully discharged and terminals capped or insulated. Batteries should be handled per Section 7. Personal protective equipment per Section 8 should be utilized.

Dispose of batteries in accordance with local, state, and federal laws and regulations. Recycling as a disposal method is encouraged.

Section 14. Transportation Information

Hazardous Classification	Based on Watt Hours
<p align="center">Label for Conveyance</p>	
<p align="center">UN Number</p>	<p>UN3480, UN3481</p>
<p align="center">Shipping Name</p>	<p>UN 3480, Lithium Ion batteries UN 3481, Lithium Ion batteries, contained in equipment UN3481, Lithium Ion batteries, packaged with equipment</p>
<p align="center">Hazard Classification</p>	<p>Class 9 – Subjected to dangerous goods regulations.</p>
<p align="center">Packing Instruction</p>	<p>IATA, PI 967 Section I.</p>
<p align="center">Documentation</p>	<p>Each consignment must be accompanied with document containing information required for UN 3480 exception as applicable.</p>

Section 15. Regulatory Information

Regulations specifically applicable to UEC Electronics’ battery products include:

- Exposure limits of battery ingredients listed in Section 2 as defined by OSHA and ACGIH
- IATA/ICAO (Air Transportation): UN3480, UN3481
- IMDG (Sea Transportation) – UN3480, UN3481
- Transportation with US-DOT: 49 Code of Federal Regulations



Section 16. Other Information

The information contained herein is compiled from sources considered to be dependable and is, to the best of UEC Electronics' knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either express or implied), or guarantee is made to the accuracy, reliability, or completeness of the information contained herein.

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