

MATERIAL SAFETY DATA SHEET (MSDS)

Product Name: Li-ion Battery

Issued and Revised Date: 2nd July-2018

Report Number: MMI11CNW44349716

1. PRODUCTS AND COMPANY IDENTIFICATION

Product Name: Li-ion Battery

Applicable Models/Sizes: HYDL 18650 3.7v 2200mAh 8.14Wh

CLUB-FL& CLUB-SP

Supplier Identification:

Cluson Engineering Limited Limited Unit 6 Bedford Road Petersfield Hampshire GU32 3LJ

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2. HAZARDS IDENTIFICATION

Hazard categories	Not dangerous with normal use. Do not dismantle, open or shred, Lithium ion Cell the ingredients contained within or their ingredients could be harmful.
Appearance, Colour, Odour	Solid object with no odour
Primary Route (s) of Exposure	These chemicals are contained in a sealed stainless steel enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, Ingestion, Eye contact and Skin content.
Potential Health Effects	ACUTE (Short term): see Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns. Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapours or mists from a ruptured battery may cause respiratory irritation. Ingestion: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin. Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye. NIC (Long term): see Section 11 for additional toxicological data

3 COMPOSITION / INFORMATION ON INGREDIENTS

Information about the chemical nature of product:

Chemical Composition	CAS No.	EC#	Weight
Cobaltate, lithium	12190-79-3	235-362-0	31.31
Graphite	7782-42-5	231-955-3	15.05
Electrolyte	-	-	12.40
Diaphragm	-	-	2.27
Copper	7440-50-8	231-159-6	7.27
Aluminium	7429-90-05	231-072-3	4.74
Plastic Paper	-	-	25.48
Nickel	7440-02-0	231-111-4	1.48

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4. FIRST-AID MEASURES

General information: No special measures required

▶ After eye contact:

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical assistance if irritation persists.

▶ After skin contact:

Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

▶ After inhalation:

Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.

▶ After swallowing:

Do not induce vomiting. Get medical attention.

5. FIRE-FIGHTING MEASURE

▶ Suitable extinguishing media:

Use extinguishing agent suitable for local conditions and the surrounding environment such as dry powder, CO₂

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture. Battery may burst and release hazardous decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature (150°C (302F)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in close proximity.

Specific protective actions for fire-fighters

Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit.

6. ACCIDENTAL RELEASE MEASURES

▶ Personal Precautions, protective equipment and emergency procedures: Restrict access to area until completion of clean-up.

Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.

▶ Environmental Precautions: Prevent material from contaminating soil and from entering sewers or waterways.

▶ Methods and materials for containment: Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth.

Clean up spills immediately.

▶ Methods and materials for cleaning up: Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water, collect all contaminated wash water for proper disposal.

7. HANDLING AND STORAGE

▶ Handling

Specific safe handling advice: Don't handle Lithium ion Cell with metalwork. Do not open, damaged or burning, forbidden to damage the battery. Ensure good ventilation at the workplace. Prevent formation of dust. Information about protection against explosions and fires: keep away from sources of ignition - No smoking.

▶ Storage conditions If the Lithium ion Cell is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium ion Cell periodically. 3 months: -10°C-40°C, 45%RH to 85%RH; And recommended at 0°C-35°C for long period storage. The voltage for a long time storage shall be 3.7V-4.2V range. Keep out of reach of children. Do not expose Lithium ion Cell to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

▶ Engineering controls: Use local exhaust ventilation or other engineering control sources of dust, mist fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.

▶ Personal Protective: Respiratory Protection: Not necessary under normal circumstances. Skin and body Protection: Not necessary under normal conditions. Wear suitable protective clothing and gloves if handling an open or leaking battery. Hand protection: Wear suitable gloves if handling an open or leaking battery. Eye Protection: Not necessary under normal conditions. Wear safety glasses if handling an open or leaking battery.

▶ Other protective Equipment: Have a safety shower and eye wash fountain readily available in the immediate work area.

▶ Hygiene Measures: Do not eat, drink, or smoke in work area. Maintain good housekeeping.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Cylindrical

Colour Blue

Odour N/A : Odour threshold N/A pH: N/A - Melting point/freezing point: N/A , initial boiling point and Boiling range: Not Available

Flash point: Not Available Upper/lower flammability or explosive limits: Not available Vapour Pressure: Not Applicable Vapour

Pressure: Not Applicable Vapour pressure, kPa at 20°C : Not Applicable Flash point: N/A

Density/relative density: Not Available Solubility in water: Insoluble n-octanol/water partition coefficient: not available

Auto-ignition temperature: N/A Decomposition temperature: N/A Evaporation rate: Not Available Flammability (soil, gas): Not Available

Viscosity: Not Applicable

(N/A = Not applicable)

10. STABILITY AND REACTIVITY

▶ Stability: No data available.

▶ Chemical stability: Stable

▶ Possibility of hazardous reactions: No data available.

▶ Incompatible Materials: Acids, Oxidizing agents, Bases

▶ Conditions to avoid: Flames, sparks, and other sources of ignition, incompatible materials.

▶ Incompatibilities materials: Oxidizing agents, acid, base.

▶ Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

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11. TOXICOLOGICAL INFORMATION

- ▶ Irritation: No data available
- ▶ Sensitization: Not Available
- ▶ Neurological Effects: Not Available
- ▶ Teratogenicity: Not Available
- ▶ Reproductive Toxicity: Not Available
- ▶ Toxicologically Synergistic Materials: Not Available

12. ECOLOGICAL INFORMATION

- ▶ General Note: Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- ▶ Anticipated behaviour of a chemical product in environment/possible environmental impact/ecotoxicity: Not Available

13. DISPOSAL CONSIDERATIONS

- ▶ Product disposal recommendation: Recycle or dispose of in accordance with government, state & local regulations.
- ▶ Packaging disposal recommendation: be aware discarded batteries may cause fire, tape the battery terminals to insulate them. Don't disassembly the battery. Completely discharge containers may be recycled or re-used. Observe local, state and federal laws and regulations. The potential effects on the environment and human health of the substances used in batteries and accumulators, the desirability of disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection so as to facilitate treatment and recycling.

14. TRANSPORT INFORMATION

- ▶ UN number: 3480
- ▶ UN Proper shipping name: Lithium ion Batteries
- ▶ Transport Hazard class(es): 9
- ▶ Marine pollutant (Yes/No) - No

Transport information:

ICAO /IATA: Can be shipped by air in accordance with International Civil Aviation Organisation (ICAO), TI or International Air Transport Association (IATA), DGR Packaging Instructions (PI) 965 Section IB appropriate of IATA DGR 59th (2018 Edition) for transportation.

IMDG CODE: Shipping may be done in accordance with the IMDG Code 2016 Edition (Amdt 38-16).

DOT: Other requirements for the US Department of Transportation (DOT) Subchapter C, Hazardous Materials Regulations if shipped in compliance with 49 CFR 173.185.

ADR/ADN: Transport Requirements for United Nations Economic Commission for Europe (UNECE) ADR/ADN, Applicable as from 1st January 2017.

In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.

15. REGULATORY INFORMATION

Dangerous Goods Regulations

Recommendations on the Transport of Dangerous Goods-Model Regulations (20th revised edition)

Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria.

International Air Transport Association (IATA)

International Maritime Dangerous Goods (IMDG Code 2016 Edition Amdt 38-16)

Technical Instructions for Safe Transport of Dangerous Good

Classification and code of dangerous goods (GB 6944-2012)

2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Toxic Substance Control Act (TSCA)

Code of Federal Regulations

In accordance with all Federal, State and local laws.

16. ADDITIONAL INFORMATION

To the best of our knowledge, the information contained herein is accurate. However, neither the above name supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

The data/information contain herein has been reviewed and approved for general release on the basis that the document contains no export controlled information.

*****End of Report*****

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