# SAFETY DATA SHEET
# Lithium-Ion Battery

**Revision Date:** June 19, 2015 **Version:** 2.1
**Supersedes:** October 31, 2013

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## Section 1 – Identification of the Substance/Mixture and of the Company/Undertaking

**Product Name:** Lithium-ion rechargeable battery
**Parts Identification:** Rechargeable batteries for Cliplight Hemiplus, Hemiplus 3-Way, Hemi Mini, 87DCPlus, 450Plus and Clipstrip Aqua
**Part Numbers:** 114303, 114333, 114301, 410190, 87DCPlus, 450DCPlus, 111113
**Product Class:** Lithium-ion batteries for LED lights
**Manufacturer:** Cliplight Manufacturing
961 Alness Street
Toronto, ON M3J 2J1, Canada
**Telephone:** +1 416 736 9036

**Emergency Telephone:** +1 613 996 6666 (Canutec)

## Section 2 – Hazards Identification

**NOTE: These lithium-ion rechargeable batteries are sealed units and are not harmful under conditions of normal use as recommended by the manufacturer.**

**The information in this section relates to unusual conditions resulting from abuse in which the battery electrodes and electrolyte are exposed.**

**These products as supplied are manufactured articles under 29CFR 1910.1200, WHMIS 2015 and (EC) No 1272/2008 and therefore are not considered hazardous products and do not require an SDS under the relevant regulations.**

**GHS Classification**
Skin irritation: Category 2
Skin sensitization: Category 1
Eye irritation: Category 2
Specific target organ toxicity, single exposure: Category 3
Carcinogen: Category 1B

**Label elements:**

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:**
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves, protective clothing and eye protection.
P302 + P350 IF ON SKIN: Wash with plenty of soap and water.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical attention.
P337 + P313 If eye irritation persists: Get medical attention.
P362 + P352 Take off contaminated clothing and wash before re-use.
P501 Dispose of contents/container in accordance with local and national regulations.

## Section 3 – Composition/Information on Ingredients

| Ingredient Name | CAS No. | EC No. | Composition, wt% |
|---|---|---|---|
| Lithium cobalt oxide | 12190-79-3 | 235-362-0 | 37 |
| Graphite | 7782-42-5 | 231-955-3 | 25 |
| Copper foil | 7440-50-8 | 231-159-6 | 10 |
| Ethylene Carbonate | 96-49-1 | 202-510-0 | 5.7 |
| Diethyl carbonate | 105-58-8 | 212-786-4 | 5.7 |
| Dimethyl carbonate | 616-38-6 | 210-478-4 | 5.7 |
| Aluminum foil | 7429-90-5 | 231-072-3 | 4 |
| Lithium hexafluorophosphate | 21324-40-3 | 244-334-7 | 0.5 |

Remaining weight due to cell/battery casing.

## Section 4 – First-Aid Measures

**Inhalation**
Remove person to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

**Eye Contact**
Remove contact lenses and immediately flush eyes with copious amounts of water for at least 15 minutes. Obtain medical attention.

**Skin Contact**
Immediately wash skin with soap and copious amounts of water. If irritation persists or if contact has been prolonged, obtain medical attention.

**Ingestion**
Do NOT induce vomiting. Wash out mouth with water provided person is conscious. Call a physician immediately.

**Acute and Delayed Symptoms**
Ingestion of battery contents can lead to severe gastrointestinal tract irritation and potential burns.
Inhalation of vapours may cause severe irritation of the upper respiratory tract and difficulty in breathing.
Eye contact can lead to severe eye irritation and irreversible damage.
Skin contact may cause burns.

**Special Treatment Needed**
The above symptoms should be dealt with by medical personnel.

## Section 5 – Fire-Fighting Measures

**Extinguishing media**
Use carbon dioxide, dry chemical powder, or clean agent fire extinguisher.

**Special hazards arising from the substance or mixture**
Battery may burst and release hazardous decomposition products when exposed to a fire situation.
Hazardous products formed on combustion include cobalt oxide, lithium oxide, copper oxide and aluminum oxide as well as carbon dioxide/monoxide and nitrogen oxides. Hydrogen fluoride and hydrofluoric acid may be present.

**Advice for firefighters**
Self-contained breathing apparatus and protective clothing as required.

## Section 6 – Accidental Release Measures

**Personal precautions**
Wear chemical-resistant gloves, safety glasses with side shields or chemical safety goggles and protective clothing. Use suitable respirator when high concentrations of vapours or fumes are present.

**Environmental precautions**
Shut off all sources of ignition. Ensure adequate ventilation. Prevent runoff to sewers and waterways.

**Methods and materials for containment and cleaning up**
Sweep up using a method that does not generate dust. Protect spill area from moisture. Do not use water for cleanup. Collect the spilled material by absorption with inert materials such as vermiculite, clay or diatomaceous earth. Place the spilled material, batteries etc. into plastic bags and keep in containers for pick-up. Dispose of waste as described in Section 13.

## Section 7 – Handling and Storage

**Precautions for safe handling**
Broken, leaking or ruptured batteries must be handled according to Section 6. The following procedures refer to batteries in their normal condition.
Do not short batteries or install with incorrect polarity. Keep in original packaging until use. Batteries may explode or cause burns if disassembled, crushed or exposed to fire or high temperatures. Wash hands after handling. Keep away from food and drink.

**Conditions for safe storage**
Store in a cool, dry, well-ventilated place. Keep away from heat, sparks, flame and moisture. Avoid extended exposure to sunlight.

## Section 8 – Exposure Controls/Personal Protection

**Control Parameters**

Components with workplace controls

| | | | | |
|---|---|---|---|---|
| Lithium cobalt oxide | CAS 12190-79-3 | TWA | 0.02 mg/m3 | USA, ACGIH Threshold Limit Value |
| | | TWA | 0.1 mg/m3 | UK EH40 WEL |
| Graphite | CAS 7782-42-5 | TWA | 2.5 mg/m3 | USA, NIOSH recommended exposure limits |
| | | | 5 mg/m3 | USA, OSHA limits for air contaminants |
| | | | 5 mg/m3 | USA, OSHA occupational exposure limits |
| | | TWA | 10 mg/m3 | UK EH40 WEL |
| | | TWA | 3 mg/m3 | Australian workplace exposure standards for airborne contaminants |
| | | TWA | 2 mg/m3 | Canada, British Columbia OEL |
| | | | | Canada, Alberta OEL |
| | | TWAEV | 5 mg/m3 | Canada, Quebec OELs |
| Lithium hexafluorophosphate | CAS 21324-40-3 | TWA | 2.5 mg/m3 | USA, OSHA limits for air contaminants |
| | | | | USA, OSHA occupational exposure limits |
| | | TLV | 2.5 mg/m3 | USA, ACGIH Threshold Limit Value |
| | | TWA | 2.5 mg/m3 | UK EH40 WEL |
| | | | | EC Directive 2000/39/EC |
| | | TWA | 2.5 mg/m3 | Australian workplace exposure standards for airborne contaminants |
| | | TWA | 2.5 mg/m3 | Canada, British Columbia OEL |
| | | | | Canada, Alberta OEL |
| | | TWAEV | 2.5 mg/m3 | Canada, Quebec OELs |

**Engineering Controls**
Have eye bath available. Use non-sparking tools.

**Protective Equipment**
No special protective equipment is required under normal conditions; otherwise, see section 6.

**Hygiene**
Follow good industrial hygiene procedures. Keep away from food, beverages and feed. Wash thoroughly after handling. Wash contaminated clothing before re-use.

## Section 9 – Physical and Chemical Properties

| | |
|---|---|
| Appearance | Blue or green |
| Odour | None |
| Odour threshold | No data available |
| pH | No data available |
| Melting point/freezing point | No data available |
| Initial boiling point/ boiling range | No data available |
| Flash point | No data available |
| Evaporation rate | No data available |
| Flammability or explosive limits | No data available |
| Vapour pressure | No data available |
| Vapour density | No data available |
| Density | No data available |
| Solubility | No data available |
| Partition coefficient: n-octanol/water | No data available |
| Auto-ignition temperature | No data available |
| Decomposition temperature | No data available |
| Viscosity | No data available |

**ELECTRICAL PROPERTIES**

| PART No. | PRODUCT IDENTIFICATION | BATTERY CONFIGURATION | VOLTAGE (V) | mA-h RATING | W-h |
|---|---|---|---|---|---|
| 114303 | Hemiplus | 4 in parallel | 3.7 | 8800 | 32.6 |
| 114333 | Hemiplus 3-Way | 4 in parallel | 3.7 | 8800 | 32.6 |
| 114301 | Hemi Mini | 2 in parallel | 3.7 | 4400 | 16.3 |
| 410190 | battery | 4 in parallel | 3.7 | 8800 | 32.6 |
| 87DCPlus | 87DCPlus | Single cell | 3.7 | 2200 | 8.15 |
| 450DCPlus | 450DCPlus | Single cell | 3.7 | 2200 | 8.15 |
| 111113 | Clipstrip Aqua | Single cell | 3.7 | 2200 | 8.15 |

## Section 10 – Stability and Reactivity

**Reactivity**
See the information that follows in this section.

**Chemical stability**
Stable under recommended conditions of transport, storage and use.

**Possibility of hazardous reactions**
Remote when cell or battery is in undamaged condition. Leaking contents react with water and can produce corrosive hydrogen fluoride as well as flammable and potentially explosive hydrogen gas.

**Conditions to avoid**
Keep away from heat, flames and sparks. Do not incinerate. Do not puncture or crush battery cells.

**Incompatible materials**
Avoid exposure to water, acids, bases, and strong oxidizing or reducing agents.

**Hazardous decomposition products**
Fire produces carbon monoxide and dioxide, phosphorus oxide, lithium oxide, copper oxide and aluminum oxide fumes. Hydrogen fluoride and hydrofluoric acid may be produced.

## Section 11 – Toxicological Information

The toxicological properties of these products have not been investigated. Some information for components is provided below.

**Acute toxicity**

Oral LD50 rat: Graphite - >2000 mg/kg (female)
Ethylene carbonate - 10,000 mg/kg
Dimethyl carbonate – 13,000 mg/kg
Lithium hexafluorophosphate - >50-300 mg/kg (female)

Dermal LD50 rabbit: Ethylene carbonate - >3000 mg/kg
Dimethyl carbonate - >5000 mg/kg

Inhalation LC50 rat: Graphite – 2000 mg/kg – 4h

Intraperitoneal LD50 mouse: Copper - 3.5 mg/kg

Subcutaneous LD50 rat: Diethyl carbonate – 8500 mg/kg

**Skin corrosion/irritation**
Rabbit: Graphite – no skin irritation

Human: Lithium hexafluorophosphate – causes severe burns (Human Skin Model Test)

**Serious eye damage/irritation**
Rabbit: Graphite – no skin irritation

**Respiratory or skin sensitization**
Mouse: Graphite – did not cause sensitisation
Lithium hexafluorophosphate - did not cause sensitisation

**Repeated dose toxicity**
Graphite – rat male – feed
NOAEL – 813 mg/kg

**Germ cell mutagenicity**
Graphite – in vitro assay - S. typhimurium
Result: negative
Lithium hexafluorophosphate – Ames test - S. typhimurium
Result: negative

**Carcinogenicity**
Lithium cobalt oxide: IARC 2B-Group 2B: Possibly carcinogenic to humans

Diethyl carbonate: Equivocal tumerogenic agent by RTECS criteria
Not identified as a human carcinogen by IARC

No other component of these products is identified as a human carcinogen by IARC.

**Reproductive toxicity**
Diethyl carbonate: Developmental toxicity- hamster – intraperitoneal:
Effect on embroyo or fetus – fetotoxicity (except death)
Specific developmental abnormalities – craniofacial including nose and tongue

**Specific target organ toxicity – single exposure**
Graphite - May cause respiratory tract irritation
Diethyl carbonate – May cause respiratory tract irritation

**Aspiration Hazard**
No data available

**Potential Health Effects**
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: Causes eye irritation.
Ingestion: May be harmful if swallowed.
Other: May cause cancer.
Target organs: Lungs

## Section 12 – Ecological Information

No data are available for the ecological effects of these products; some information on components is provided below.

**Aquatic Toxicity**

Toxicity to fish: Graphite
Semi-static test LC50 – 96 h
Species: Danio rerio
Result: >100 mg/l

Aluminum
LC50 – 96 h
Species: Oncorhynchus mykiss
Result: 0.12 mg/l

Aluminum
Mortality LOEC – 96 h
Ctenopharyngodon idella
Result: 0.1 mg/l

| | |
|---|---|
| Toxicity to other organisms: | Graphite<br>Static test EC50 – 48 h<br>Species: Daphnia magna<br>Result: >100 mg/l |
| Toxicity to algae | Graphite<br>Static test EC50 – 72 h<br>Pseudikirchneriella subcapitata<br>Result: >100 mg/l |

**Persistence and degradability**
No data available

**Bioaccumulative potential**

Aluminum
Bioaccumulation – 56 d
Salvelinus fontinalis
Result: 268 µg/l

Bioaccumulation factor
BCF: 36

**Mobility in soil**
No data available

**Other adverse effects**
Aluminum: Very toxic to aquatic life.

## Section 13 – Disposal Considerations

**Product**
Contact a licensed professional waste disposal service to dispose of batteries, electrodes, electrolyte or contaminated packaging. Do not incinerate batteries. Observe all federal, state, and local environmental regulations.

**Contaminated packaging**
Dispose of as for product.

## Section 14 – Transport Information

This battery has been tested to ensure compliance with subsection 38.3 of the UN Manual of Tests and Criteria. It meets the requirements of packing instruction 965 of IATA.DGR for transportation and special provision 188 of IMDG and DOT 49CF 173.02. This product is not classified as dangerous goods for transport.

Lithium batteries must be protected from short circuit during shipping. Keep in original packaging. Confirm no leakage from a container. Protect from moisture and rough handling. Do not ship damaged containers.

Shipping Name: Lithium Ion Batteries
UN #: 3480
Class: 9
Packing Group: II

## Section 15 – Regulatory Information

All components of these products are listed in the U.S. Toxic Substances Control Act (TSCA) Inventory.

All components of these products are on the Canadian Domestic Substances List (DSL) except lithium hexafluorophosphate which is listed on the Non-domestic Substances List (NDSL).

All components of these products are on or in compliance with the Australian Inventory of Chemical Substances (AICS).

A chemical safety assessment has not been carried out for these products.

## Section 16 – Other Information

**HMIS Classification**

| **Cell Contents** | | **Product** | |
|---|---|---|---|
| Health Hazard: | 2 | Health Hazard: | 0 |
| Flammability: | 2 | Flammability: | 1 |
| Physical Hazards: | 0 | Physical Hazards: | 0 |

**Notes to this Revision**

This version 2.1 (June 19, 2015) has been updated from the previous version of October, 2013 to conform to the format requirements of the GHS, OSHA Hazard Communications Standard 2012, WHMIS 2015 and (EU) No 453/2010.

No substantive changes have been made to information related to the safe use, handling, storage and transportation of the product.