Safety Data Sheet (SDS) — Lithium-Ion (Li-Ion) Batteries

The information and recommendations below are believed to be accurate at the date of document preparation. Harvard Battery Inc makes no warranty or merchantability or any other warranty, expressed or implied, with respect to this information and assumes no liability resulting from its use. This SDS provides guidelines for safe use and handling of product. It does not, and cannot, advise all possible situations. All specific uses of this product must be evaluated by the end user to determine if additional safety precautions should be taken.

SECTION 1 - IDENTIFICATION

Product Name	Lithium-Ion Battery
Common Name(s)	Li-Ion Battery
Synonyms	Litigated Cobalt Oxide; Li-Ion Secondary Battery; Li-Ion Rechargeable Battery
DOT Description	Dry Battery
Chemical Name	Lithium-Ion

Distributed By	**Harvard Battery Inc.**	**Emergency Number**	(800) 535-5053
Address	**1008 Astoria Blvd., Suite E**	**International Emergency Number**	(800) 535-5053
	Cherry Hill, NJ 08003		

SECTION 2 – HAZARD(S)

Unusual Fire and Explosion Hazards Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or short circuit condition. Damaged or opened cells or batteries can result in rapid heating and the release of flammable vapors. Vapors may be heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back.

SECTION 3 – COMPOSITION

Chemical Name	CAS No.	Percentage %
Lithium Cobalt Oxide	12190-79-3	25-40
Iron	7439-89-6	15-25
Aluminum	7429-90-5	2-6
Graphite: Natural Graphite: Artificial	7782-42-5 7740-44-0	10-20
Copper	7440-50-8	5-15
Organic Electrolyte		10-20

SECTION 4 – FIRST AID MEASURES

For Li-Ion Chemicals:

Inhalation Get fresh air. If symptoms persist seek medical attention

Eyes and Skin **Skin:** Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; wash with soap and wate
Eyes: Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; get immediate medical a

Ingestion Ingestion of battery chemicals can be harmful. Call The National Battery Ingestion Hotline (202-625-3333) 24 hours a day, for procedures treating ingestion of chemicals. Dilute with plenty of water, do not induce vomiting, and seek immediate medical attention.

SECTION 5 – FIRE-FIGHTING MEASURES

Extinguisher Media Use water, foam or dry powder

Special Fire Fighting Procedures Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Damaged batteries that are NOT hot or burning should be placed in a sealed plastic bag or plastic-lined metal container.
Chemical resistance gloves must be used to handle all battery components.
If cells rupture and a thermal event follows: using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place in approved container (after cooling if necessary) and dispose in accordance with local regulations.

SECTION 7 – HANDLING AND STORAGE

1. Use only approved chargers and charging procedures.
2. Do not disassemble a battery or bypass any safety device.
3. Batteries should be separated from other materials and stored in a non-combustible, well-ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks.
4. Do not place batteries near heating equipment; do not expose to direct sunlight for extended periods.
5. Do not store batteries above 60 °C or below -32°C. Store batteries in a cool (below 21°C (70°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 will result in the battery venting flammable liquid and gases.

6. Do not store batteries in a manner that allows terminals to short circuit.

SECTION 8 – EXPOSURE/PERSONAL PROTECTION

Respiratory Protection	None required under normal handling conditions; see also *Section 5 – Fire Fighting Measures* .
Gloves	Wear chemical resistant gloves if cell is ruptured, corroded, or leaking materials.
Safety Glasses	Always wear safety glasses with working with battery cells.

SECTION 9 – PHYSICAL/CHEMICAL PROPERTIES

Boiling Point	N/A	**Melting Point**	N/A
Vapor Pressure	N/A	**Vapor Density**	N/A
Specific Gravity	N/A	**Evaporation Rate**	N/A
Solubility in Water	N/A	**Appearance and Odor**	Geometric, solid object

SECTION 10 – STABILITY & REACTIVITY

Reactivity in Water	N/A	**Auto-Ignition Temperature**	N/A
Flash Point	N/A	**Flammable Limits in Air, by vol.**	N/A
Percent Volatile By Volume	N/A		
Stable	Avoid electrically shorting the cell and prolonged exposure to humid conditions. See also *Section 7 – Handling and Storage.*		
Incompatibility (materials to avoid)	N/A		

SECTION 11 – TOXICOLOGICAL INFORMATION

Threshold Limit Value	Exposure limit of $LiCoO_2$ = 0.1mg/m3 (OSHA)
Signs and Symptoms of Exposure	None. (In fire or rupture situations, refer to sections 4, 5, & 8.)
Medical Conditions Generally Caused by Exposure	Chemicals may cause burns to skin, eyes, gastrointestinal tract and mucous membranes.
Routes of Entry	Skin, Eyes, Ingestion (swallowing), Inhalation (fumes)

SECTION 12 – ECOLOGICAL INFORMATION

Hazardous Decomposition Products	None under normal conditions. During Fire: combustible vapors (including CO), formation of Hydrogen fluoride (HF) and phosphorous oxides. Reaction with Water: may produce irritant Hydrogen fluoride (HF)
Hazardous Polymerization	Will not occur

When properly used and disposed, these batteries are not hazardous to the environment. Do not carelessly discard. Never discard Li-Ion batteries into a fire. Dispose of properly or recycle.

SECTION 13 - DISPOSAL

1. When completely discharged, Li-Ion batteries have no hazardous waste characteristics and can be landfilled.
2. This product does not contain any materials listed by the EPA as requiring specific waste disposal procedures.
3. When disposing of large quantities of Li-Ion batteries or cells, consult local/state/federal guidelines.
4. Fully discharge the battery and tape/cap terminals prior to disposal.

SECTION 14 – TRANSPORT

This product complies with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods regulations, and applicable U.S. DOT regulations for the safe transport of Li-Ion Battery.
This product has been tested under the provisions of the UN Manual of Tests and Criteria, Part III, sub-section 38.3 and is classified as a non-dangerous good.
Lithium ion cell/battery = UN3480 with Section II of PI965
Lithium ion cell/battery packed with equipment = UN3481 with Section II of PI966
Lithium ion cell/battery contained in equipment = UN3481 with Section II of PI967
Content in Watt-hour (Wh) AND Lithium ion cell = less than 20Wh per cell
Lithium ion battery = less than 100Wh per battery
Land transport: DOT Code of Federal Regulations (USA)
Sea transport: IMDG according to Special Provision 188
Air transport: ICAO-TI and IATA-DGR Li-Ion Battery according to NEW PACKING INSTRUCTION 965-967 of IATA DGR

SECTION 15 – REGULATORY INFORMATION

No additional

SECTION 16 - OTHER