national power CORPORATION®

Product Name:	Lithium-Ion Battery
NPC Document:	SDS-10 Rev 2024
Customer	< 100Wh
Effective Date:	January 1, 2024

This product is an "article" used with the contents sealed. Therefore, issuing and providing SDS is not required by the GHS, or any law based on the GHS. This document has been prepared not to satisfy requirements such as GHS, but for the purpose of providing safety information to customers. Refer to the documentation issued by the shipper to know whether your current packaging and content comply with transport regulations.

Product Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION
   - Product name: Lithium-Ion rechargeable battery
   - Product code: None (Models assembled with capacities of less than 100Wh)
   - Company name: National Power Corporation
   - Address: 4330 W. Belmont Ave., Chicago, IL. 60641, USA
   - Telephone number: +773-685-2662
   - Fax number: +1-773-685-8316
   - Emergency telephone number: [North America] 1-800-424-9300 [International] 001-703-527-3887 or 1-703-741-5970. CHEMTREC #CCN232907

2. HAZARDS IDENTIFICATION
   For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there are no physical hazards such as ignition, explosion and chemical hazards due to leakage of battery contents.
   However, if exposed to a fire, mechanical shocks, electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.
   Also, if it is exposed to high temperature, i.e., surrounding fire, there is a possibility that irritating or harmful gas may be generated.
   - GHS classification: Not available *(This product is outside the scope of GHS system since it's considered as an "article".)*
   - Most important hazard and effects:
     Inhalation: The steam of the electrolyte has an anesthesia action and irritates the respiratory tract.
     Skin contact: The steam of the electrolyte irritates skin. Electrolyte contact irritates the skin.
     Eye contact: The steam of the electrolyte irritates eyes. Electrolyte contact irritates the eye.
     Environmental effects: Since a battery remains in the environment, do not dispose of into the waste stream.
   - Specific hazards:
     If the electrolyte contacts water, it will generate hydrogen fluoride. Since the leaked electrolyte is flammable, do not expose to heat or flame.
     Electrolyte and Lithium transition metal oxidate ($Li[M]_m[O]_n$ *2) are flammable. Risk of explosion by fire if batteries are disposed in fire or heated above 100 degrees C.

3. COMPOSITION / INFORMATION ON INGREDIENTS
   - Substance or preparation: Preparation
   - Information about the chemical nature of product: (a)

Portion	Material name	CAS No.	Concentration range (wt. %)
Positive electrode	Lithium transition metal oxidate ($Li[M]_m[O]_n$ [b])	12190-79-3 12031-65-1 12057-17-9 182442-95-1 207803-51-8	20~60
Positive electrode's base	Aluminum	7429-90-5	1~10
Negative electrode	Carbon	7782-42-5 7440-44-0	10~30
Negative electrode	Copper	7440-50-8	1~15
Electrolyte	Ethyl methyl carbonate Diethyl carbonate Ethylene carbonate Lithium hexafluorophosphate	623-53-0 105-58-8 96-49-1 21324-40-3	5~25
Outer case	Plastic or PVC	1333-86-4 9002-89-2	1~10

a) *Not every product includes all of these materials.*
b) *The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter "m" and "n" means the number of atoms.*

4. FIRST-AID MEASURES

Released internal cell materials

- Inhalation: Seek medical attention.
- Skin contact: Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.
- Eye contact: Do not rub eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.
- Ingestion: Rinse thoroughly. Do not induce vomiting, unless instructed by medical personnel. Seek medical attention immediately.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
- Specific hazards: Corrosive gas may be emitted during fire.
- Specific methods of firefighting: When the battery burns with other combustibles simultaneously, take fire- extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
- Special protective equipment for firefighters: Refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

6. ACCIDENTAL RELEASE MEASURES

Released internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the following:.

- Precautions for human body: Remove spilled materials with protective equipment (refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS). Avoid inhaling the gas and avoid contact.
- Environmental precautions: Do not dispose into the waste stream.
- Prevention of secondary hazards: Avoid scattering. Do not expose the collected materials close to an open flame.

7. HANDLING AND STORAGE

Handling suggestions:

- Do not short circuit.
- Avoid polarity reverse connection when installing the battery to an instrument.
- Do not expose the battery to water, seawater, acid or a strong oxidizer.
- Do not damage or remove the external housing.
- Keep the battery away from heat and fire.
- Do not disassemble or reconstruct the battery.
- Prevent mechanical shock.
- Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.

Storage:

- Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
- Discharge the battery to less than or equal to 50% then store at -20~40 degree C in a dry (humidity: 45~85%) place. Since deterioration will increase at higher temperatures than in low temperatures, do not store at high temperature ranges beyond the period that is specified.
- Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminals if the package is damaged. Do not use conductive or easy to breach packaging material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

- Control parameters

  ACGIH has not been mentioned control parameter of electrolyte.

- Personal protective equipment

  Respiratory protection: Respirator with air cylinder, dust mask
  Hand protection: Protective gloves.
  Eye protection: Goggles or protective glasses designed to protect against released liquids.
  Skin and body protection: Working clothes with long sleeves and long trousers.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance

  Physical state: Solid
  Form: Cylindrical or Prismatic enclosure.
  Color: Any (normally black, gray or white).
  Odor: No odor

Density: N/A	Molecular Weight: N/A
Boiling Point: N/A	Solubility: N/A
Melting Point: N/A	pH: N/A
Evaporation Rate: N/A	Viscosity: N/A
Vapor Pressure: N/A	Other Information: N/A

10. STABILITY AND REACTIVITY
- Stability: Normally stable unless a strong mechanical shock is applied or heated excessively.
- Possibility of hazardous reactions: Damage to the container may cause leakage of contents. Contents may leak or ignite due to temperature rise.
- Conditions to avoid: Crushing or deformation, use and storage at 80 degree C or higher or at high humidity. Usage at a voltage or a current outside the rating and external short circuit.
- Incompatible materials: Conductive material such as water or metal pieces. Oxidizing agent such as bleach.
- Hazardous decomposition products: Irritating or harmful gases are released if a leakage or fire occurs.

11. TOXICOLOGICAL INFORMATION

Organic Electrolyte
- Acute toxicity: LD_{50}, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

12. ECOLOGICAL INFORMATION

Persistence/degradability: Since the battery and internal components remain in the environment, do not bury or dispose into the waste stream.

13. DISPOSAL CONSIDERATIONS

Collection or disposal only according to local regulations.

Neither container or packaging is contaminated during normal use. When contaminants from leaked battery cells are present, dispose as industrial waste subject to special controls.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Transport cargo without falling, dropping and breakage. Prevent collapse of cargo. The container must be handled with care. Please also refer to Section 7-HANDLING AND STORAGE.

15. REGULATORY INFORMATION

Regulations specifically applicable to the product:

UN regulation
- UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment.
- Proper shipping name: “Lithium-ion batteries” – 3480. “Lithium-ion batteries contained in equipment” or “Lithium-ion batteries packed with equipment” – 3481.
- Class: 9

Regulation depends on region and transportation mode
- Worldwide - Air transportation: ICAO TI/IATA-DGR [packing instruction 965 section IB] (When shipping batteries “packed with” or “contained in” equipment, use packing instruction 966 or 967,section II).
- Worldwide - Ocean transportation: IMO-IMDG Code [special provision 188]
- USA – U.S. DOT/PHMSA HMR – 49 Code of Federal Regulations

** Regarding overlapping regulations, please refer to Section 14-TRANSPORT INFOMATION.*

16. OTHER INFORMATION
- This safety data sheet is offered to an agency who handles this product.
- The agency should utilize this safety data sheet effectively (for display and training) and take proper measures.
- The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

Reference

US DOT/PHMA HMR

ICAO TI

Dangerous Goods Regulations – 65th Edition Effective 1 January 2024: International Air Transport Association (IATA)

IMDG Code – 2022 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2023 (ADR); The United Nations Economic Commission for Europe (UNECE)