

Safety Data Sheet

Product Name: Nickel Metal Hydride Battery**Chemical Systems:** Nickel Metal Hydride**MSDS Reference No.:** UH001**Company Name:** Minamoto Battery (HK) Ltd.**Designed for Recharge:** Yes**Issue day:** 2 January 2021

1. MANUFACTURER INFORMATION

Minamoto Battery (HK) Ltd. Flat A-6, 8/F., Mai Hing Ind. Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong. Tel. : 27934790

2. HAZARDOUS INGREDIENTS

IMPORTANT NOTE:

The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

| MATERIAL OR INGREDIENTS | % W. t. |
|---|----------|
| Nickel as nickel hydroxide (CAS# 12054-48-7) nickel oxide (CAS# 1313-99-1) nickel powder (CAS# 7440-02-0) | 15-50 |
| Potassium Hydroxide (CAS# 1310-58-3) | 0-6 |
| Cobalt as cobalt metal (CAS# 7440-48-4) cobalt oxide (CAS# 1306-19-0) cobalt hydroxide (CAS# 21041-93-0) | 2.5-6.0 |
| Sodium Hydroxide (CAS# 1310-73-2) | 0-4 |
| Zinc as zinc metal (CAS# 7440-66-6) zinc oxide (CAS# 1314-13-2) zinc hydroxide (CAS# 20427-58-1) | < 3 |
| Mercury (CAS# 7439-97-6) | 0-0.0005 |
| Lead as lead metal (CAS# 7439-92-1) lead oxide (CAS# 1317-36-8) | 0-0.0005 |
| Cadmium as cadmium metal (CAS# 7440-43-9) cadmium oxide (CAS# 1306-19-0) cadmium hydroxide (CAS# 21041-95-2) | <0.01 |

3. HAZARDS IDENTIFICATION

Under normal conditions of use, the battery is hermetically sealed.

Ingestion:

Swallowing a battery can be harmful.

Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Inhalation:

Contents of an open battery can cause respiratory irritation. Hypersensitivity to nickel can cause allergic pulmonary asthma. Provide fresh air and seek medical attention.

Skin Contact:

Contents of an open battery can cause skin irritation and/or chemical burns. Nickel, nickel compounds, cobalt, and cobalt compounds can cause skin sensitization and an allergic contact dermatitis. Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.

Eye Contact:

Contents of an open battery can cause severe irritation and chemical burns. Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

4. FIRST AID MEASURES

Eye contact: Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Take a medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.**Skin contact:** Wash the contact areas immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.**Inhalation:** Remove to fresh air immediately. Take a medical treatment.

5. FIRE –FIGHTING MEASURES

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture. Fire fighters should wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

If fire or explosion occurs when batteries are on charge, shut off power to charger.

In case of fire where nickel metal hydride batteries are present, apply a smothering agent such as METL-X, sand, dry ground dolomite, or soda ash, or flood the area with water. A smothering agent will extinguish burning nickel metal hydride batteries. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving nickel metal hydride batteries can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended.

Fire fighters should wear self-contained breathing apparatus. Burning nickel metal hydride batteries can produce toxic fumes including oxides of nickel, cobalt, aluminum, manganese, lanthanum, cerium, neodymium, and praseodymium.

7. HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life.

Mechanical Containment: Never seal or encapsulate nickel metal hydride batteries. Do not obstruct safety release vents on batteries. Encapsulation (potting) of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. However, this battery is capable of delivering very high short circuit currents. Prolonged short circuits will cause high cell temperatures which can cause skin burns. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, and metal covered tables or metal belts used for assembly of batteries into devices.

Do not open battery. The negative electrode material may be pyrophoric. Should an individual cell from a battery become disassembled, spontaneous combustion of the negative electrode is possible. This is much more likely to happen if the electrode is removed from its metal container. There can be a delay between exposure to air and spontaneous combustion.

Charging: This battery is made to be charged many times. Because it gradually loses its charge over a few months, it is good practice to charge battery before use. Use recommended charger. Improper charging can cause heat damage or even high pressure rupture. Observe proper charging polarity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions.

Respiratory Protection: Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.

Gloves: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Open Battery Storage: Battery should not be opened. Should a cell become disassembled, the electrode should be stored in a fire-proof cabinet, stay away from combustibles.

9. PHYSICAL AND CHEMICAL PROPERTIES

The chemicals mentioned in substance identification are contained in a hermetically sealed battery can. Under conditions of normal use, the chemicals will not be release.

10. STABILITY AN DREACTIVITY

Since batteries utilize a chemical reaction they are actually considered a chemical product. As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as charge, discharge, ambient temperature etc are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. TOXICOLOGICAL INFORMATION

Ingestion of a battery can be harmful. For US call The National Capital Polson Control Center (1-800-222-1222) day or night- for advice and follow-up. For other countries please contact the local Toxic Centers.

12. ECOLOGICAL INFORMATION

Under normal condition of use, the battery is hermetically sealed and does not release chemicals listed in substance identification. It does not pose a physical or health risk to users.

13. DISPOSAL METHOD

Dispose of batteries according to government regulations.

14. TRANSPORTATION INFORMATION

| Regulatory Body | Special Provisions |
|-----------------|------------------------------|
| ADR | 295 – 304,598 |
| IMO | UN3496 SP117 and SP963 |
| UN | UN3496 |
| US DOT | 49 CFR 172.102 Provision 130 |
| IATA | A199 |

- Form of Transportation** : Sea
- UN No.** : 3496
- UN Proper Shipping Name** : Batteries, Nickel-Metal Hydride
- Transport Hazard Class** : 9
- Packing Group Number** : N/A
- Environmental Hazards** : No
- Guidance Transport in bulk** : According to ANNEX II of Marpol 73/78 and IBC Code
- Special Precaution** : SP117 & SP963

- a) In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for Minamoto Alkaline batteries has been designed to be compliant with these regulatory concerns.

Minamoto Nickel Metal Hydride batteries (sometimes referred to as “Dry cell”) are not defined as dangerous goods under the IATA Dangerous Goods Regulations 62nd edition 2021, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR). These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following special provisions.

In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words “not restricted” and the Special Provision number A199 be provided on the air waybill, when an air waybill is issued.

- b) International Maritime Organization (IMO) IMDG Code regulated these products as UN 3496 BATTERIES, NICKEL METAL HYDRIDE, Class 9 dangerous goods with Special Provision 117 and 963 assigned.

SP117:

Only regulated when transported by sea.

SP963:

Nickel metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in equipment are not subject to the provisions of this Code.

All other nickel-metal hydride cells or batteries shall be securely packed and protected from short circuit.

They are not subject to other provisions of this Code provided that they are loaded in a cargo transport unit in a total quantity of less than 100 kg gross mass. When loaded in a cargo transport unit in a total quantity of 100 kg gross mass or more, they are not subject to other provisions of this Code except those of 5.4.1, 5.4.3 and column (16) of the dangerous good list in Chapter 3.2.

The requirements of these sections are:

- (1) Dangerous goods transport documentation to accompany the shipment.
- (2) The shipment must be described as “UN3496, BATTERIES, NICKEL-METAL HYDRIDE, CLASS 9” on the shipper’s declaration for dangerous goods.
- (3) The dangerous goods description must also be entered on the Dangerous Cargo Manifest and / or the detailed stowage plan in compliance with the IMDG Code requirements for shipboard documentation.

15. REGULATORY INFORMATION

Special requirement be according to the local regulatory.

16. OTHER INFORMATION

The data in this Material Safety Data Sheet relates only to the specific material designated herein.