

BATTERY INFORMATION SHEET for Tridonic NiMH Batteries with a capacity of 2.2 Ah & 4.0 Ah

1. IDENTIFICATION

1.1 Product

Product Identity (used on the label): Nickel Metal Hydride Battery

1.2 Supplier

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1.3 Emergency contact

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2. HAZARD IDENTIFICATION

GHS Classification: N.A.

Under normal conditions of use, the battery is hermetically sealed. If the electrolyte is leaked, hazardous material may be released.

Human Health Effects:

- Inhalation: The electrolyte inhalation can cause respiratory irritation. It could be possibly carcinogen.
- Skin contact: The electrolyte can cause skin irritation, chemical burns. Nickel compounds, cobalt and cobalt compounds can cause skin sensitization and an allergic contact dermatitis.
- Eye contact: The electrolyte leaked from the battery cell is strong alkali, can cause severe irritation and chemical burns.
- Ingestion: If the battery is swallowed and opened, or the electrolyte is ingested, the electrolyte irritates the mouth and the throat seriously, may lead to vomiting, nausea, hematemesis, stomach pains and diarrhea.

Environmental Effects:

The battery cell remains in the environment. Do not throw it out into the environment.

Specific Hazards:

As previously described.

3. COMPOSITION, INFORMATION ON INGREDIENTS

| Chemical Name/Common Name | CAS No. | %/wt |
|---------------------------|---------------------------------|---------|
| Aluminum | 7429-90-5 | < 2 |
| Cobalt metal | 7440-48-4 | 2.5-6.0 |
| Cobalt oxide | 1307-96-6 | |
| Cobalt hydroxide | 21041-93-0 | |
| Lithium Hydroxide | 1310-65-2 | 0-4 |
| Manganese | 7439-96-5 | 0-4 |
| Lanthanum | 7439-91-0 | <13 |
| Cerium | 7440-45-1 | |
| Neodymium | 7440-00-8 | |
| Praseodymium | 7440-10-0 | 35-55 |
| Nickel hydroxide | 12054-48-7 | |
| Nickel oxide | 1313-99-1 | |
| Nickel powder | 7440-02-0 | <7 |
| Potassium Hydroxide | 1310-58-3 | |
| Sodium Hydroxide | 1310-73-2 | |
| Zinc metal | 7440-66-6 | <3 |
| Zinc oxide | 1314-13-2 | |
| Zinc hydroxide | 20427-58-1 | |
| Iron | 7439-89-6 | 10-25 |
| Other Non-hazardous | Water, Paper, Plastic and Other | Balance |

4. FIRST AID MEASURES

Inhalation:

If electrolyte leakage occurs, cover the victim in a blanket, move to the place of fresh air and keep quiet. Seek medical attention immediately. When dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

Skin Contact:

If electrolyte leakage occurs, remove contaminated clothes and shoes immediately. Wash the adherence or contact region with soap and plenty of water. Seek medical attention immediately.

Eye Contact:

If electrolyte leakage occurs, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

Ingestion:

If battery cell and electrolyte is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry sand, chemical powder fire extinguishing medium.

Unusual Fire and Explosion Hazards: Acrid or harmful fume is emitted during fire.

Special Protective equipment and Precautions for fire-fighters: 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. Protective equipment written in Section VIII.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Forbid unauthorized person to enter. Remove leaked materials with protective equipment written in Section VIII.

Environmental precautions: Do not throw out into the environment.

Containment and Clean Up:

Dilute the leaked electrolyte with water and neutralize with diluted sulfuric acid. The leaked solid is moved to a container. The leaked place is fully flushed with water.

7. HANDLING USAGE AND STORAGE PRECAUTIONS

Handling:

Prevention of user exposure: Not necessary under normal use. Prevention of fire and explosion: Not necessary under normal use. Precaution for safe handling: Do not damage or remove the external tube.

Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water and seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or throw down. Never disassemble, modify or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by Tridonic batteries.

Storage:

Storage conditions (suitable to be avoided): Avoid direct sunlight, high temperature, high humidity.

The cells and batteries shall not be stored in high temperature, the maximum temperature allowed is 60 °C for a short period during the shipment. Otherwise the cells may be leakage and can result in shortened cycle life.

Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids

Packing material (recommended, not suitable): insulated and tear-proof materials are recommended.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Engineering Control:**

No engineering measure is necessary during normal use. If internal cell materials are leaked, the information below will be useful.

Exposure Control Limit:

| Common Chemical Name / General Name | OSHA PEL | ACGIH TLV |
|--|--|--|
| Aluminum metal (as Al) | TWA 15 mg/m ³ (total) TWA 5 mg/m ³ (resp) | - |
| Cobalt metal (As Co) | TWA 0.1 mg/m ³ | TWA 0.02 mg/m ³ |
| Lithium Hydroxide | - | - |
| Manganese compounds (as Mn) | (Ceiling) 5 mg/m ³ | TWA 0.02 mg/m ³ (resp.) |
| Nickel, metal and insoluble compounds | (as Ni) TWA 1 mg/m ³ | Elemental: 1.5mg/m ³ (IHL); Insoluble inorganic compounds: 0.2mg/m ³ (IHL) |
| Potassium Hydroxide | - | - |
| Sodium Hydroxide | 2 mg/m ³ TWA | (Ceiling) 2 mg/m ³ |
| Zinc oxide | Respirable fraction: 5 mg/m ³ | Respirable fraction: 2 mg/m ³ |

TWA: Time Weighted Average

ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Value

OSHA PEL: Occupational Safety & Health Administration Permissible Exposure Limit

Personal protective equipment:

- Respiratory protection: Protective mask
- Hand protection: Protective gloves
- Eye protection: Protective glasses designed to protect against liquid splashes
- Skin and body protection: Working clothes with long sleeve and long trousers

9. Physical and Chemical Properties

Appearance: Solid, Cylindrical Shape, Metallic color

Odor: Odorless

Odor Threshold: N.A.

pH: N.A.

Melting point / freezing point: N.A.

Initial boiling point and boiling range: N.A.

Flash point: N.A.

Evaporation rate: N.A.

Flammability (solid, gas): N.A.

Upper/lower flammability or explosive limits: N.A.

Vapor pressure: N.A.

Vapor density: N.A.

Relative density: N.A.

Solubility: Insoluble in water

Partition coefficient n-octanol/water: N.A.

Auto-ignition temperature: N.A.

Decomposition temperature: N.A.

Viscosity: N.A.

10. STABILITY AND REACTIVITY

Stability: Stable under normal use

Possibility of hazardous reactions: By misuse of a battery cell or the like, oxygen or hydrogen accumulates in the cell and the internal pressure rises. These gases may be emitted through the gas release vent. When fire is near, these gases may take fire. When a battery cell is heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

Conditions to avoid: Direct sunlight, high temperature and high humidity

Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids

Hazardous decomposition products: Acrid or harmful fume is emitted during fire.

11. TOXICOLOGICAL INFORMATION

There is no toxicity data for Nickel Metal Hydride Battery. Under normal conditions of use, the battery is non-toxic.

12. ECOLOGICAL INFORMATION

Persistence/degradability: Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal:

- **Product (waste from residues):** Do not throw out a used battery cell. Recycle it through the recycling company.
- **Contaminated packaging:** Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates them, dispose them as industrial wastes subject to special control.

14. TRANSPORT INFORMATION

| Regulatory Body | Special Provisions |
|-----------------|-------------------------------|
| ADR | 295 – 304, 598 |
| IMO | UN 3496 SP117 and SP963 |
| UN | UN 3496 |
| US DOT | 49 CFR 172, 102 Provision 130 |
| IATA | A199 |

| Form of Transportation | UN No. | UN Proper Shipping Name | Transport Hazard Class | Packing Group Number | Environmental Hazards | Guidance Transport in bulk | Special Precaution |
|------------------------|--------|---------------------------------|------------------------|----------------------|-----------------------|--|--------------------|
| Sea | 3496 | BATTERIES, NICKEL-METAL HYDRIDE | 9 | - | No | According to ANNEX II of MARPOL 73/78 and the IBC Code | 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 Tridonic nickel metal hydride batteries has been designed to be compliant with these regulatory concerns.

Tridonic nickel metal hydride batteries (sometimes referred to as “Dry cell” batteries) are not defined as dangerous goods under the IATA Dangerous Goods Regulations 56th edition 2015, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR). These batteries are not subject to the dangerous goods regulations as they are compliant with 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.