



NiMH Battery Pack Safety Data Sheet

Section 1, Identification

Product Name: Nickel Metal Hydride Rechargeable Battery Pack

Not classed as a hazardous material.

COMPANY INFORMATION

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NiMH battery packs supplied for use in rechargeable electronic scales and balances. Not recommended for any other use. Not to be confused with sealed lead acid batteries (SLA) used in some of our product range.

Section 2, Hazard(s) identification

For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous material leakage. However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by misuse, the gas release vent will be operated. The battery cell case will be breached at the extreme. Hazardous materials may be released. If heated strongly or burned, acrid or harmful fume may be emitted.

Human health effects:

Inhalation: The electrolyte inhalation affects the respiratory tract membrane and the lungs. Fume may cause a cough, chest pain and dyspnea. Bronchitis and pneumonia may occur. Possibly could be carcinogen.

Skin contact: The electrolyte skin contact affects the skin seriously and may cause dermatitis.

Eye contact: The electrolyte leaked from the battery cell is strong alkali. When it goes into an eye, the cornea may be affected and it may lead to blindness.

Ingestion: The electrolyte ingestion irritates the mouth and the throat seriously results in vomiting, nausea, hematemesis, stomach pains and diarrhea.

Environmental effects:

No known significant environmental effects. Efforts should be made to recycle as the product does not degrade naturally.

Section 3, Composition/information on ingredients

A) The content of elements are based on homogeneous materials level of NiMH battery:



| Element | Lead | Cadmium | Hexavalent Chromium (Cr ₆₊) | Mercury | Polybrominated Biphenyls (PBBs) | Polybrominated DiphenylEthers (PBDEs) |
|---------|------|---------|---|---------|---------------------------------|---------------------------------------|
| % W. t. | <0.1 | <0.01 | <0.1 | <0.1 | <0.1 | <0.1 |

B) The content of elements are based on total weight of NiMH battery:

| MATERIAL OR INGREDIENTS | % W. t. |
|---|----------|
| Nickel as nickel hydroxide nickel oxide nickel powder | 30-50 |
| Potassium Hydroxide | < 20 |
| Cobalt as cobalt metal cobalt oxide cobalt hydroxide | 2.5-6.0 |
| Sodium Hydroxide | < 20 |
| Zinc as zinc metal zinc oxide zinc hydroxide | < 3 |
| Mercury | 0-0.0005 |
| Lead as lead metal lead oxide | 0-0.004 |
| Cadmium as cadmium metal cadmium oxide cadmium hydroxide | <0.002 |
| Hexavalent Chromium (Cr ₆₊) | 0-0.0005 |
| Polybrominated Biphenyls (PBBs) | Nil |
| Polybrominated Diphenyls Ethers(PBDEs) | Nil |

| | | | |
|--|------|---------------------------------------|------|
| Boiling Point | N.A. | Specific Gravity (H ₂ O=1) | N.A. |
| Vapour Pressure (mm Hg) | N.A. | Melting Point | N.A. |
| Vapour Density (AIR=1) | N.A. | Evaporation Rate (Butyl Acetate) | N.A. |
| Solubility in Water | N.A. | | |
| Appearance and Odour: Cylindrical shape cells packaged in a poly wrap with connecting leads and wires, odourless | | | |

Section 4, First-aid measures

Internal cell materials of an opened battery cell

- Inhalation :

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 :

Remove contaminated clothes and shoes immediately. Wash the adherence or contact region with soap and plenty of water. Seek medical attention immediately.



- Eye contact :

Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and internal cell materials of an opened battery cell

- Ingestion :

Do not induce vomiting. Seek medical attention immediately.

Section 5, Fire-fighting measures

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

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.

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.

Section 6, Accidental release measures

Steps to Be Taken in Case Material is Released or Spilled:

Batteries that are leaking should be handled with rubber gloves. Avoid direct contact with electrolyte.

Method of recovery and neutralization :

Dilute any leaked electrolyte with water and neutralize with diluted sulfuric acid. The leaked solid is to be moved to a container. Place of leakage to be fully flushed with water.

Wear protective clothing and a positive pressure Self-Contained Breathing Apparatus (SCBA)

Section 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.

Section 8, Exposure controls/personal protection

lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

| | | | | |
|--|----------------------|------|----------------|------|
| Occupational Exposure Limits: LTEP | | N.A. | STEP | N.A. |
| Respiratory Protection (Specify Type) | | N.A. | | |
| Ventilation | Local Exhausts | N.A. | Special | N.A. |
| | Mechanical (General) | N.A. | Other | N.A. |
| Protective Gloves | | N.A. | Eye Protection | N.A. |
| Other Protective Clothing or Equipment | | | N.A. | |
| Work / Hygienic Practices | | | N.A. | |

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 fireproof cabinet, away from combustibles.

Keep batteries between -20°C and 35°C for prolong storage.

When the cells are closed to fully charged, the storage temperature should be between -20°C and 30°C and should be controlled at 10-20°C during transportation and packed with efficient air ventilation.

Section 9, Physical and chemical properties

- Appearance
- Physical state: Solid
- Form: Cylindrical
- Color: Metallic color (without tube/label)



Odour: No odour

- pH : NA
- Specific temperatures/temperature ranges at which changes in physical state occur :

There is no useful information for the product as a mixture.

- Flash point : NA
- Explosion properties : NA
- Density : around 1.5 ~ 6.0g/cm³
- Solubility ,with indication of the solvent(s) : Insoluble in water

Section 10, Stability and reactivity

Stability : Stable under normal use

Hazardous reactions occurring under specific conditions:

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 ignite.

When a battery cell is heated strongly by the surrounding fire, acrid or harmful fumes 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 fumes emitted during fire.

Section 11, Toxicological information

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, oesophagus, 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.

Section 12, Ecological information

May be subject to local legislation.

- Persistence/degradability :



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

Section 13, Disposal considerations

Dispose of batteries according to regional regulations.

Recommended methods for safe and environmentally preferred disposal :

Product: 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.

Section 14, Transport information

This battery does not require the following items.

- TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR(ICA0)
- IATA Dangerous Goods Regulations(IATA)
- code of federal regulations (U.S.DOT)

This battery requires the following items.

- INTERNATIONAL MARITIME DANGEROUS GOODS CODE(IMO)

From the 1st January 2012, Nickel-Metal Hydride Batteries is classed as Dangerous Goods, Class 9 in accordance with United Nations Recommendations on the Transport of Dangerous Goods and will have the following UN Number:

| UN No. | Proper Shipping Name | Class or division | Packing group | Special provisions |
|--------|---------------------------------|-------------------|---------------|--------------------|
| 3496 | BATTERIES, NICKEL-METAL HYDRIDE | 9 | - | 117 963 |

Instructions and contents of Special Provisions (117 and 963) for this UN number include:

- Specifying it is only regulated when transported by sea,
- Ni-MH button cells are not subject to the provisions of this code.
- Ni-MH cells or batteries packed with or contained in equipment are not subject to the provisions of this code.
- All other Ni-MH cells or batteries shall be securely packed and protected from short circuit. They are not subject to other provisions of this code provided 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, only subject to:

- Provided dangerous goods transportation information by a) Consignor and b) Shipper.
- Stowage and segregation provisions: as prescribed in Chapter 3 of IMDG Code: "away from" sources of heat as minimum horizontal separation of 3 metres.

Prior to transportation, confirmation that there is no leakage and no spillage from a container is necessary.

Cargo must be handle without falling, dropping or breakage. Care must be taken to prevent the collapse of cargo piles or saturation by rain. Containers must be handled carefully. Packaging is constructed to prevent short-circuiting and/or electric shock. The product is handled as Non-Dangerous Goods by based on IATA(A123) for air shipment.



Section 15, Regulatory information

Regulations specifically applicable to the product are known to include:
Wastes Management and Public Cleaning Law (Japan)
Law for Promotion Effective Utilization of Resources (Japan)
EU Battery Directive 2006/66/EC
Other regulations local to the place of use may apply.

Section 16, Other information

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This PSDS is provided to customers as reference information in order to handle batteries safely.

It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling based on this information.

References

1. The Globally Harmonized System of Classification and Labeling of Chemicals) (GHS) ST/SG/AC.10/30 Rev.4,2011
2. Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations Volume 1. 17th revised edition.
3. IATA Dangerous Goods Regulations 55th Edition (2014)

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

NOTE:

The Adam Equipment product numbers that this document refers to are as follows: #302405088 (6vdc 4.5aH Battery), #309409012 (6vdc 1.3aH Battery), #303409100 (6vdc 5aH Battery). They are replacement batteries for those supplied within all of our products that require a rechargeable battery.