# Material Safety Data Sheet For NiCd Batteries

## Section Ⅰ — Product Identification

Product Name: Nickel Cadmium Battery
Nominal Voltage: 1.2V
Chemical System: Nickel/Cadmium
Manufacturer Name: JYH Technology Co., Ltd
Address:12, Bangmin Road, New Hi-Tech Development Zone District, Jiangmen City, Guangdong Province, P.R.China
Phone Number: +86-750-3808313
Fax Number: +86-750-3808133

## Section Ⅱ —Composition /Information on Ingredients

IMPORTANT NOTE: The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances.

| Chemical Name | CAS No. | %* |
|---|---|---|
| Cadmium | 7440-43-9 | 11-28 |
| Cadmium hydroxide | 21041-95-2 | 11-28 |
| Nickel (powder) | 7440-02-0 | 4-9 |
| Nickel hydroxide | 12054-48-7 | 12-20 |
| Potassium hydroxide | 1310-58-3 | <3 |
| Nylon | 24937-16-4 | <2 |
| Steel | 12597-68-1 | 11-14 |
| Total | | 100 |

*Note: Concentrations vary depending on the state of charge or discharge.

## Section Ⅲ- Hazard Classification

Classification: N.A.

## Section Ⅳ- First Aid Measures

If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately.
If electrolyte comes into contact with eyes, wash with copious amounts of water for fifteen (15) minutes, and contact a physician.
If electrolyte vapors are inhaled, provide fresh air and seek medical attention if respiratory irritation develops. Ventilate the contaminated area.

## Section Ⅴ-Fire and explosion Hazard Data

| | |
|---|---|
| Flash point: N.A | Lgnition Temp: N.A |
| Lower Explosive Limit: N.A | Upper Explosive Limit: N.A |
| Flammable Limits: N.A | |
| Extinguishing Media:<br>Any class of extinguishing medium may be used on the batteries, BUT water extinguisher is not suitable. | |

Special Fire Fighting Procedures:
Exposure to temperatures of above 212℉ can cause evaporation of the liquid content of the potassium hydroxide electrolyte resulting in the rupture of the cell. Potential for exposure to cadmium fumes during fire, use self-contained breathing apparatus.
Unusual Fire and Explosion Procedures:

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Do not dispose of battery in fire – may explode.

Do not short-circuit battery – may cause burns.

## Section Ⅵ- Accidental Release or Spillage

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

Batteries that are leakage should be handled with rubber gloves.

Avoid direct contact with electrolyte.

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

## Section Ⅶ-Handling and Storage

Safe handling and storage advice:

Batteries should be handled and stored carefully to avoid short circuits.

Do not store in disorderly fashion, or allow metal objects to be mixed with stored batteries.

Never disassemble a battery.

Do not breathe cell vapors or touch internal material with bare hands.

Keep batteries between -20℃ and 35℃ for prolong storage. When the cells are closed to fully charged, the storage temperature should be between -20℃ and 30℃ and should be controlled at 10-20℃ during transportation and packed with efficient air ventilation.

## Section Ⅷ-Exposure Controls / Person Protection

| | | |
|---|---|---|
| Occupational Exposure limits | LTEP: N.A. | STEP: 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. | |
| Respiratory Protection (Specify Type): N.A. | | |

## Section Ⅸ—Physical and Chemical Data

The battery cell is contained in a hermetically-sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. However, if exposed to a fire, explosion, extreme abuse, misuse, or improper disposal that results in breaching of the battery cell case, hazardous materials may be released. The following physical data relating to the hazardous materials contained within the battery cell are provided for the user's information.

Cadmium: Melting point (℉): 610 Boiling point (℉): 1,407

% Volatile by Volume: Vapor Pressure (mm Hg):

Specific Gravity ($H_2O$): 8.65@77¡F

Solubility in Water: Insoluble

Appearance and Odor: Silver-white, blue-tinged, lustrous metal

Cadmium Hydroxide:

Melting point (℉): 610 Boiling point (℃):

% Volatile by Volume: Vapor Pressure (mm Hg):

Specific Gravity ($H_2O$): 4.79 Vapor Density (Air = 1):

Solubility in Water: Practically Insoluble

Appearance and Odor: Powder

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Nickel Metal:

Melting point (℉): 2,831 Boiling point (℉): 5,134
% Volatile by Volume: Vapor Pressure (mm Hg):
Evaporation Rate: Vapor Density (Air = 1):
Specific Gravity ($H_2O$): 8.90
Solubility in Water: Insoluble
Appearance and Odor: Powder

Nickel Hydroxide:

Melting point (℉): * Boiling point (℉):
% Volatile by Volume: Vapor Pressure (mm Hg):
Evaporation Rate: Vapor Density (Air = 1):
Specific Gravity ($H_2O$):
Solubility in Water: Insoluble
Appearance and Odor: Apple green powder
*Note: decomposes above 392 ¡F into NIO and $H_2O$.

Potassium Hydroxide:

Melting point (℉): * Boiling point (℉):
% Volatile by Volume: Vapor Pressure (mm Hg):
Evaporation Rate: Vapor Density (Air = 1):
Specific Gravity ($H_2O$):
Solubility in Water: Soluble in 0.9 part water, 0.6 part in boiling water
Appearance and Odor: White or slightly yellow
*Note: Potassium hydroxide is present as a liquid or paste and acts as the electrolyte in the battery cell.

## Section Ⅴ- Stability and Reactivity Data

| | |
|---|---|
| Stability | Stable |
| Incompatibility (Materials to Avoid) | N.A |
| Hazardous Decomposition or Byproducts | N.A |
| Hazardous Polymerization | Will Not Occur |

## Section Ⅵ- Toxiclogical information

| | |
|---|---|
| Route(s) of Entry | Inhalation: N.A |
| | Skin: N.A |
| | Ingestion: N.A |

Health Hazard (Acute and Chronic)

In case of electrolyte leakage, skin will be itchy when contaminated with electrolyte.
In contact with electrolyte can cause severe irritation and chemical burns.
Inhalation of electrolyte vapors may cause irritation of the upper respiratory tract and lungs

## Section Ⅻ-Ecological Information

N.A.

## Section ⅩⅢ-Disposal Method

Dispose of batteries according to government regulations.

## Section ⅩⅣ-Transportation Information

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JYH batteries are considered to be "Dry cell" batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods Regulations (IMDG). The only DOT requirement for shipping these batteries is special provision A123 which states: "Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (For example, by the effective insulation of exposed terminals). The only requirements for shipping these batteries by ICAO and IATA is Special Provision A123 which states: "An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation." The international Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under Special Provision 304 which says : "Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provision of this code provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc-carbon, sliver oxide, nickel metal hydride and nickel-cadmium batteries which are non-dangerous goods. Such batteries have been packed in inner packaging in such a manner as to effectively prevent short-circuit and movement that could lead to short circuit.

## Section XV-Regulatory Information

Special requirement be according to the local regulatories.

## Section XVI-Other Information

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