Issue Date: 2026.02.04

# MATERIAL SAFETY DATA SHEET

The batteries are exempt articles and are not subject to the OSHA Hazard Communication Standard Requirement. This sheet is only provided as technical information and is referred normal use of the product in question. Zeus makes no warranty expressed or implied.

## SECTION 1 - Product and Company Identification

| | |
|---|---|
| **Product Name:**<br>Nickel Cadmium Battery | **Sizes:**<br>All NiCd Series |
| **Company:**<br>PowerCell LLC dba ZEUS Battery Products | **Telephone Number:**<br>+1 (630) 295-6800 |
| **Address:**<br>191 Covington Dr.<br>Bloomingdale, IL 60108<br>USA | **Fax Number:**<br>+1 (630) 295-6801 |
| | **Date of Preparation:**<br>February 4th, 2026 |

## SECTION 2 - 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# | Content (wt %) |
|---|---|---|
| Cadmium | 7440-43-9 | 11 to 28 |
| Cadmium hydroxide | 21041-95-2 | 11 to 28 |
| Nickel (powder) | 7440-02-0 | 4 to 9 |
| Nickel hydroxide | 12054-48-7 | 12 to 20 |
| Potassium hydroxide | 1310-58-3 | < 3 |
| Nylon | NA | < 2 |
| Steel | NA | 11 to 13 |
| Other | NA | < 1 |

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

## SECTION 3 - Hazard Classification

Classification: NA

NA = Not Applicable

## SECTION 4 - 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 5 - Fire and Explosion Hazard Data

| | |
|---|---|
| Flash Point: | NA |
| Ignition Temp: | NA |
| Lower Explosive Limit: | NA |
| Upper Explosive Limit: | NA |
| Flammable Limit: | NA |

**Extinguishing Media:**

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°F 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:**

Do not dispose of battery in fire – may explode.
Do not short-circuit battery – may cause burns.

## SECTION 6 - 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 7 - 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°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 8 - Exposure Controls / Personal Protection

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

## SECTION 9 - 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 (°F): 610

% Volatile by Volume:

Specific Gravity ($H_2O$): 8.65@77iF

Solubility in Water: Insoluble

Boiling point (°F): 1,407

Vapor Pressure (mm Hg):

### Cadmium Hydroxide:

Melting point (°F): 610
% Volatile by Volume:
Specific Gravity ($H_2O$): 4.79
Solubility in Water: Practically Insoluble
Appearance and Odor: Powder

Boiling point (°C):
Vapor Pressure (mm Hg):
Vapor Density (Air = 1):

### Nickel Metal:

Melting point (°F): 2,831
% Volatile by Volume:
Evaporation Rate:
Specific Gravity ($H_2O$): 8.90
Solubility in Water: Insoluble
Appearance and Odor: Powder

Boiling point (°F): 5,134
Vapor Pressure (mm Hg):
Vapor Density (Air = 1):

### Nickel Hydroxide:

Melting point (°F): *
% Volatile by Volume:
Evaporation Rate:
Specific Gravity ($H_2O$):
Solubility in Water: Insoluble
Appearance and Odor: Apple green powder
*Note: decomposes above 392 iF into NIO and $H_2O$.

Boiling point (°F):
Vapor Pressure (mm Hg):
Vapor Density (Air = 1):

### Potassium Hydroxide:

Melting point (°F): *
% Volatile by Volume:
Evaporation Rate:
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.

Boiling point (°F):
Vapor Pressure (mm Hg):
Vapor Density (Air = 1):

## SECTION 10 - Stability and Reactivity Data

| | |
|---|---|
| Stability | Stable |
| Incompatibility (Materials to Avoid) | NA |
| Hazardous Decomposition or Byproducts | NA |
| Hazardous Polymerization | Will not occur |

## SECTION 11 - Toxicological Information

Route(s) of Entry

| | |
|---|---|
| Inhalation: | NA |
| Skin: | NA |
| Ingestion: | NA |

Health Hazard (Acute and Chronic)

In case of electrolyte leakage, skin will be itchy when contaminated with electrolyte.
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 12 - Ecological Information

NA

## SECTION 13 - Disposal Method

Dispose of batteries according to government regulations.

## SECTION 14 - Transportation Information

**Nickel Cadmium Battery**
**Dry Cell**
**Nickel Cadmium Batteries have passed UN38.3 testing.**

**U.S DOT:** The Transportation of Nickel Cadmium batteries (Dry Cell) are governed by US DOT CFR49 Part 171-185 of the US Hazardous Materials Regulations (HMR). "Dry Cell" batteries are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT).

**IATA Dangerous Goods Regulations DGR:** The International Air Transportation of Nickel Cadmium batteries (Dry Cell) are governed International Air Transport Association IATA. The Transportation of "Dry Cell" batteries are "NOT RESTRICTED" in accordance with Special Provision A 123.

**IMDG:** The international Sea Transportation of Nickel Cadmium batteries (Dry Cell) are governed by the International Maritime Dangerous Goods (IMDG) regulations.

## SECTION 15 - Regulatory Information

Special requirement be according to the local regulatories.

## SECTION 16 - Other Information

The data in this Material Safety Data Sheet relates only to the specific material designated herein.
If you need further information, please contact a Zeus sales representative.