



# Material Safety Data Sheet

## 1. Product Identification & Manufacturer:

Product: Ni- Metal Hydride Batteries  
Chemical System: Nickel/Metal Hydride  
Designated for Recharge: Yes

Manufacturer:  
 Harding Energy's Proprietary Battery Co.,  
Address: Shenzhen, China  
Tel: 231-798-7033  
Emergency Telephone: 231-798-7033  
Fax: 231-798-7044  
Email: [ljames@hardingenergy.com](mailto:ljames@hardingenergy.com)

## 2. Composition/Ingredients

Composition	CAS No.	Content (%)
Nickel-hydroxide[Ni(OH) <sub>2</sub> ]	12054-48-7	25--40wt%
Cobalt [Co]	7440-48-4	3--5wt %
Manganese	7439-96-5	25--40wt%
Lanthanum	7439-91-0	
Cerium	7440-45-1	
Neodymium	7440-00-8	
Potassium-hydroxide [KOH]	1310-58-3 71769-53-4	2--3wt%
Polypropylene [PP]	9003-07-0	1--3wt%
Iron [Fe]	7439-89-6	15--25wt%
Water [H <sub>2</sub> O]	7732-18-5	4--7wt %
Polyamide [PA66]	63428-84-2	0.2--1wt%
Rubber [EPDM]	25038-36-2	0.1--0.5wt%

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

### 3. Hazards identification:

UN Classification Number / NFPA2 Rating

Nickel Metal Hydride Battery are exempted from Dangerous Goods

UN – Recommendations on the Transport of Dangerous Goods: (ST/SG/AC.10/C3/70, Annex And ST/SG/AC, 10/C, 3/74/Add.1)

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### 4. Physical Data for Battery

Melting point (°C) : NA

Boiling point (°C) : NA

%Volatile by Volume : NA

Vapor pressure (mmHg) : NA

Evaporation Rate : NA

Vapor Density (Air = 1) : NA

Specific Gravity (H2O) : NA

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### 5. First Aid Measures

The product contains corrosive electrolyte, in case of electrolyte leakage from the battery, action described below are required.

Skin contact: Wash this contacted areas off immediately with plenty of water. If appropriate procedures are not taken, this may cause sores on the skin.

Eye contact: Flush the eyes with plenty of clean water without rubbing.  
Take a medical treatment.  
If appropriate procedures are not taken, this may cause an eye irritation.

Inhalation : Remove to fresh air immediately.  
Take a medical treatment.

Extinguishing method: Since vapor, generated from burning batteries may make eyes, nose and throat irritated, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases

Fire extinguishing agent: Dry chemical, alcohol-resistant form, carbon dioxide and plenty of water are effective.

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### 6. Fire and Explosion Hazard Data

Flash Point: NA

Lower Explosive Limit: NA

Upper Explosive Limit: NA

Extinguishing Media : Water, Foam, Dry. Any class of extinguishing medium  
May be used on the batteries or their packing material.

: Exposure to temperatures of above 100°C can cause venting of the liquid electrolyte. Internal shorting could also cause venting of the electrolyte. There is potential for exposure to iron, nickel, cobalt, rare earth metals, manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

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## 7. Accidental Release

Steps to be taken in case material is released or spilled:

The preferred response is to leave the area and allow the batteries to cool and the vapors to dissipate. Avoid skin and eye contact or inhalation of vapors. Collect all released material in a plastic lined metal container and remove spilled liquid with absorbent. Doing this, protect your skin and eyes with gloves and protection glasses.

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## 8. Handling and storage

- 1) When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
  - 2) Use strong materials for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
  - 3) Do not let water penetrate into packaging boxes during their storage and transportation.
  - 4) The batteries will be stored at room temperature.
  - 5) Do not store the battery in places of the high temperature exceeding 35deg.C or under direct sunlight or in front of a stove. Please also avoid the places of high humidity. "Be sure not to expose the battery to condensation, water drop or not to store it under lower temperature than -20°C.
  - 6) Batteries are sure to be packed in such a way to prevent short circuits under conditions normally encountered in transport.
  - 7) Please avoid storing the battery in the place where it is exposed to the electricity, so that no damage will be caused to the protection circuit of the battery pack
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## 9. Exposure controls/personal protection

Respiratory protection (specify type)	Not necessary under conditions of normal use
Ventilation:	Not necessary under conditions of normal use
Protective gloves:	Not necessary under conditions of normal use
Eye protection:	Not necessary under conditions of normal use
Other protective clothing or equipment:	Not necessary under conditions of normal use

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## 10. Physical & chemical properties

The chemicals mentioned in Section 3 are contained in a hermetically sealed can. Under conditions of normal use, the chemicals will not be released.

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## 11. Stability & reactivity

Nickel Metal Hydride Batteries are contained in a stable cell container and are hermetically sealed to avoid any chemical release under conditions of normal use.

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## 12. Health Hazard Data

Skin contact	: Exposure to the electrolyte contained inside the battery may result in chemical burn, Exposure to nickel may cause dermatitis in some sensitive individuals.
Eye contact	: Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.
Ingestion	: If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.
Inhalation	During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within battery case.

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### 13. Reactivity Data

- 1) The batteries are stable under normal operating condition.
- 2) Hazardous polymerization will not occur.
- 3) Hazardous decomposition products: Nickel-dihydroxide, cobalt, Metal hydride
- 4) Conditions to avoid: heat, open flames, sparks, and moisture.
- 5) Incompatibilities (materials to avoid):The battery cells are encased in a non-reactive container; if the container is breached, avoid contact of internal battery components with acids, aldehydes, and carbonate compounds.

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### 14. Transport Information

#### Transported by air:

Not classified as dangerous goods in the meaning of air transport regulations.

Regulatory body	Special provision
IATA(56th Edition-2015)	A123

International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA), Special Provision A 123 state: 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.

LEXEL sealed Nickel Metal Hydride batteries are not subject to these regulations and special provision as their terminals are protected from short-circuit when packaged for transport.

#### Transported by sea:

Recommendations on the Transport of Dangerous Goods (Model Regulations and Manual of Tests and Criteria) adopted at the thirty-fifth, thirty-sixth, and thirty-seventh sessions. The content includes that adding the Batteries. Nickel-Metal Hydride for transport of dangerous goods only when transported by sea. The hazardous level is the 9th level and the UN number is UN3496.

Regulatory body	Special provision
IATA(56th Edition -2015)	A199

(Reference documents: ST/SG/AC.10/C3/70, Annex and ST/SG/AC,10/C, 3/74/Add. I)

Regulatory body	Special provision
IMDG (17 <sup>th</sup> Edition-2011)	117

SP 117 state: subject to these regulations only when transported by sea.

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## 15. Regulatory Information:

- ATA DGR A123-2015 dangerous goods regulations.
- ICAO Technical Instructions for the safe transport of dangerous goods by air.
- in inner packing in such matter as to effectively prevent Short circuits and to prevent Movements which could lead to short circuits.

UN-Recommendations on the Transport of Dangerous Goods Model Regulations and Manual of Tests and Criteria) (ST/SG/AC.10/C.3/70, Annex and ST/SG/AC.10/C.3/74/Add.1)

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## 16. Other information

The data in this Material Safety Data Sheet relates only to the specific material designated herein. More information concerning shipping, testing, marking and packaging can be obtained from Harding Energy Co. representative.

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