

Material Safety Data Sheet

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Revision Number 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name NI-CD Battery

Recommended Use Nickel-cadmium battery.

Supplier Address

Xinxiang Liandahuazhong Power
Source CO.,LTD.
North of Railway Station, Xiaoji Town
Xinxiang
Henan
453700
CN
Phone:86-15136701486
Fax:86-373-5593481
Contact:YunLei Zhou
Email:lianda@liandatex.com
Contact Phone86-13937379377

2. HAZARDS IDENTIFICATION

Emergency Overview

In case of rupture:
Harmful by inhalation, in contact with skin and if swallowed

Appearance White

Physical State Solid.

Odor Odorless

OSHA Regulatory Status

This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery. Please refer to Section 13 for safe disposal of the cadmium and/ or lead containing batteries

Potential Health Effects

Acute Toxicity

Eyes

In case of rupture: May cause burns.

Skin

In case of rupture: Harmful in contact with skin.

Inhalation

In case of rupture: Harmful by inhalation.

Ingestion

In case of rupture: Harmful if swallowed.

Chronic Effects

Upon rupture of sealed battery:

Contains a known or suspected reproductive toxin.

This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B)

Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. May cause adverse effects on the bone marrow and blood-forming system.

Aggravated Medical Conditions	Pre-existing eye disorders. Skin disorders. Blood disorders. Kidney disorders. Lungs. Nasal cavities. Prostate Reproductive system.
Environmental Hazard	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %
Cadmium hydroxide (Cd(OH) ₂)	21041-95-2	11-26
Cadmium and compounds (as Cd)	7440-43-9	11-26
Nickel	7440-02-0	8-17
Iron	7439-89-6	10-30
Nickel hydroxide	12054-48-7	5-12
Potassium hydroxide	1310-58-3	3-7
Nylon 64	24936-71-8	1 - 5
Water	7732-18-5	1 - 5

4. FIRST AID MEASURES

General Advice	First aid is upon rupture of sealed battery.
Eye Contact	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately.
Skin Contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If symptoms persist, call a physician.
Inhalation	Move to fresh air. If symptoms persist, call a physician. If not breathing, give artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Call a physician immediately
Ingestion	Call a physician immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.
Notes to Physician	Treat symptomatically.
Protection of First-aiders	Use personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

5. FIRE-FIGHTING MEASURES

Flammable Properties	This article contains flammable electrolytes and therefore can cause a fire hazard if ruptured and chemicals are leaked out.
Flash Point	Not determined.
Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Hazardous Combustion Products	Carbon oxides.
Explosion Data	
Sensitivity to Mechanical Impact	No.
Sensitivity to Static Discharge	No.

Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus and protective suit.

NFPA**Health Hazard** 0**Flammability** 0**Stability** 0**Physical and Chemical Hazards** Rating is provided for sealed battery**6. ACCIDENTAL RELEASE MEASURES****Personal Precautions**

Use personal protective equipment. Keep people away from and upwind of spill/leak.

Environmental Precautions

Prevent entry into waterways, sewers, basements or confined areas. Do not flush into surface water or sanitary sewer system.

Methods for Containment

Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.

Methods for Cleaning Up

Use personal protective equipment. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE**Handling**

In case of rupture: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Do not breathe vapors/dust.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Keep out of the reach of children.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Cadmium hydroxide (Cd(OH) ₂) 21041-95-2	TWA: 0.01 mg/m ³ Cd TWA: 0.002 mg/m ³ Cd respirable fraction	Action Level: 2.5 Åµg/m ³ Cd	IDLH: 9 mg/m ³ Cd dust and fume
Cadmium and compounds (as Cd) 7440-43-9	TWA: 0.01 mg/m ³ TWA: 0.002 mg/m ³ respirable fraction	TWA: 0.1 mg/m ³ fume applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect TWA: 0.2 mg/m ³ dust applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect TWA: 5 Åµg/m ³ Action Level: 2.5 Åµg/m ³ (vacated) STEL: 0.3 ppm fume Ceiling: 0.3 mg/m ³ fume applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect Ceiling: 0.6 mg/m ³ dust applies to any operations or sectors for which the Cadmium standard is stayed or otherwise not in effect	IDLH: 9 mg/m ³ dust
Nickel 7440-02-0	TWA: 1.5 mg/m ³	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	IDLH: 10 mg/m ³ TWA: 0.015 mg/m ³
Nickel hydroxide 12054-48-7	TWA: 0.2 mg/m ³ Ni inhalable fraction	TWA: 1 mg/m ³ Ni (vacated) TWA: 1 mg/m ³ Ni	IDLH: 10 mg/m ³ Ni TWA: 0.015 mg/m ³ except Nickel carbonyl Ni
Potassium hydroxide 1310-58-3	Ceiling: 2 mg/m ³	(vacated) Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.

Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Engineering Measures

Showers
Eyewash stations
Ventilation systems

Personal Protective Equipment

Eye/Face Protection Skin and Body Protection Respiratory Protection

Tightly fitting safety goggles. If splashes are likely to occur, wear: Face-shield.
Protective gloves.
No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Respiratory protection must be provided in accordance with current local regulations

Hygiene Measures

When using, do not eat, drink or smoke. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Wear suitable gloves and eye/face protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	White.	Odor	Odorless.
Odor Threshold	No information available.	Physical State	Solid
pH	UNKNOWN		
Flash Point	No information available.	Autoignition Temperature	No information available
Decomposition Temperature	No information available	Boiling Point/Range	No information available
Melting Point/Range	No information available		
Flammability Limits in Air	No information available	Explosion Limits	No information available
Water Solubility	Insoluble in water.	Solubility	No information available
Evaporation Rate	No information available	Vapor Pressure	No data available
Vapor Density	No data available	VOC Content (%)	
Partition Coefficient: n-octanol/water			

10. STABILITY AND REACTIVITY

Stability	Stable under recommended storage conditions.
Incompatible Products	Incompatible with strong acids and bases. Incompatible with oxidizing agents.
Conditions to Avoid	Heat, flames and sparks. Exposure to air or moisture over prolonged periods.
Hazardous Decomposition Products	Thermal decomposition can lead to release of toxic/corrosive gases and vapors
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Cadmium and compounds (as Cd)	= 2330 mg/kg (Rat)	-	= 8 mg/L (Rabbit) 4 h
Nickel	> 9000 mg/kg (Rat)	-	-
Iron	984 mg/kg (Rat)	-	-
Nickel hydroxide	= 1515 mg/kg (Rat)	> 2 g/kg (Rat)	= 1200 mg/m ³ (Rat) 4 h
Potassium hydroxide	= 214 mg/kg (Rat)	-	-
Water	90090 mg/kg (rat)	-	-

Chronic Toxicity

Chronic Toxicity

Upon rupture of sealed battery:

Contains a known or suspected reproductive toxin.

This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B)

Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. May cause adverse effects on the bone marrow and blood-forming system.

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Cadmium hydroxide (Cd(OH) ₂)	A2	Group 1	Known	X
Cadmium and compounds (as Cd)	A2	Group 1	Known	X
Nickel		Group 1 Group 2B	Known Reasonably Anticipated	X
Nickel hydroxide	A1	Group 1	Known	X

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA: (Occupational Safety & Health Administration)

X - Present

Target Organ Effects

Blood. Eyes. Kidney. Lungs. Nasal cavities. Prostate Respiratory system. Skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Cadmium and compounds (as Cd)		LC50: 0.003 mg/L (96 h flow-through) Oncorhynchus mykiss LC50: 0.002 mg/L (96 h) Cyprinus carpio LC50: 0.016 mg/L (96 h) Oryzias latipes LC50: 0.24 mg/L (96 h static) Cyprinus carpio LC50: 0.0004-0.003 mg/L (96 h) Pimephales promelas LC50: 21.1 mg/L (96 h flow-through) Lepomis macrochirus LC50: 4.26 mg/L (96 h semi-static) Cyprinus carpio LC50: 0.006 mg/L (96 h static) Oncorhynchus mykiss		EC50: 0.0244 mg/L (48 h Static) Daphnia magna
Nickel	EC50: 0.174 - 0.311 mg/L (96 h static) Pseudokirchneriella subcapitata EC50: 0.18 mg/L (72 h) Pseudokirchneriella subcapitata	LC50: 10.4 mg/L (96 h static) Cyprinus carpio LC50: 1.3 mg/L (96 h semi-static) Cyprinus carpio LC50: > 100 mg/L (96 h) Brachydanio rerio		EC50: 1 mg/L (48 h Static) Daphnia magna EC50: > 100 mg/L (48 h) Daphnia magna
Iron		LC50: 0.56 mg/L (96 h semi-static) Cyprinus carpio LC50: 13.6 mg/L (96 h static) Morone saxatilis		
Potassium hydroxide		LC50: 80 mg/L (96 h static) Gambusia affinis		

Chemical Name	Log Pow
Potassium hydroxide	0.83

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261).

Contaminated Packaging Do not re-use empty containers.

US EPA Waste Number D006

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Cadmium hydroxide (Cd(OH) ₂) - 21041-95-2	(hazardous constituent - no waste number)			
Cadmium and compounds (as Cd) - 7440-43-9		Included in waste streams: F006, F039, K061, K069, K100	1.0 mg/L regulatory level	
Nickel - 7440-02-0	(hazardous constituent - no waste number)	Included in waste streams: F006, F039		
Nickel hydroxide - 12054-48-7	(hazardous constituent - no waste number)			

California Hazardous Waste Codes 181

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California EHW	California Carc	California Hazardous Waste	California Waste - Part 2
Cadmium hydroxide (Cd(OH) ₂)	Toxic			STLC (for PBTs): 1.0 mg/L TTLC (for P&Bs) (EHW): 10000 mg/kg as Cd TTLC (for PBTs): 100 mg/kg
Cadmium and compounds (as Cd)	Toxic powder Ignitable powder			STLC (for PBTs): 1.0 mg/L TTLC (for P&Bs) (EHW): 10000 mg/kg as Cd TTLC (for PBTs): 100 mg/kg TCLP (for CA Toxicity): 1.0 mg/L
Nickel			Toxic powder Ignitable powder	STLC (for PBTs): 20 mg/L TTLC (for PBTs): 2000 mg/kg
Nickel hydroxide				STLC (for PBTs): 20 mg/L TTLC (for PBTs): 2000 mg/kg
Potassium hydroxide			Toxic Corrosive	

14. TRANSPORT INFORMATION

DOT Not regulated

TDG Not regulated

MEX Not regulated

ICAO Not regulated

IATA Not regulated

IMDG/IMO Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Exempt
 DSL Does not Comply

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Cadmium hydroxide (Cd(OH) ₂)	21041-95-2	11-26	0.1
Cadmium and compounds (as Cd)	7440-43-9	11-26	0.1
Nickel	7440-02-0	8-17	0.1
Nickel hydroxide	12054-48-7	5-12	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard Yes
 Chronic Health Hazard Yes
 Fire Hazard No
 Sudden Release of Pressure Hazard No
 Reactive Hazard No

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Cadmium hydroxide (Cd(OH) ₂)		X		
Cadmium and compounds (as Cd)		X	X	
Nickel		X	X	
Nickel hydroxide		X		X
Potassium hydroxide	1000 lb			X

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product contains the following substances which are listed hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act:

Chemical Name	CAS-No	Weight %	HAPS data	VOC Chemicals	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Cadmium hydroxide (Cd(OH) ₂)	21041-95-2	11-26	Present (includes any unique chemical substance that contains Cadmium as part of its infrastructure)			
Cadmium and compounds (as Cd)	7440-43-9	11-26				
Nickel	7440-02-0	8-17				
Nickel hydroxide	12054-48-7	5-12				

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Cadmium and compounds (as Cd)	10 lb	
Nickel	100 lb	
Nickel hydroxide	10 lb	
Potassium hydroxide	1000 lb	

U.S. State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals:

Chemical Name	CAS-No	California Prop. 65
Nickel hydroxide	12054-48-7	Carcinogen
Cadmium hydroxide (Cd(OH) ₂)	21041-95-2	Carcinogen
Nickel	7440-02-0	Carcinogen
Cadmium and compounds (as Cd)	7440-43-9	Carcinogen Developmental Male Reproductive

U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Nickel hydroxide	X	X	X	X	X
Potassium hydroxide	X	X	X		X
Cadmium hydroxide (Cd(OH) ₂)		X	X	X	X
Nickel	X	X	X	X	X
Cadmium and compounds (as Cd)	X	X	X	X	X

International Regulations

Mexico - Grade

Moderate risk, Grade 2

Chemical Name	Carcinogen Status	Exposure Limits
Nickel hydroxide		Mexico: TWA= 0.1 mg/m ³ Mexico: STEL= 0.3 mg/m ³
Cadmium hydroxide (Cd(OH) ₂)	A2	Mexico: TWA= 0.01 mg/m ³ Mexico: TWA= 0.002 mg/m ³
Nickel		Mexico: TWA 1 mg/m ³
Cadmium and compounds (as Cd)	A2	Mexico: TWA 0.01 mg/m ³ Mexico: TWA 0.002 mg/m ³

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

Non-controlled

Chemical Name	NPRI
Nickel hydroxide	X

Nickel	X
Cadmium and compounds (as Cd)	X

Legend

NPRI - National Pollutant Release Inventory

16. OTHER INFORMATION

Prepared By Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

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Revision Note No information available

General Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet