

SAFETY DATA SHEET

Regulation (EC) No 1907/2006 (REACH), Annex II
(COMMISSION REGULATION (EU) No 453/2010)

Version 1
Product Name Ni-MH Battery

Issue Date 16-Apr-2015
Revision date 16-Apr-2015

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name	Ni-MH Battery
Chemical Name	Nickel and Metal Hydride

Other means of identification

Model	AA2000
Voltage	1.2 V
Watt-Hour	2.4WH
Battery Weight	26.6g

Recommended use of the chemical and restrictions on use

Recommended Use	Power supply
Reference No.	No information available

Details of the supplier of the safety data sheet

Supplier	Guangzhou Great Power Energy & Technology Co., Ltd.
Address	922 Xicun Section, Shiliang Road, Shawan, Panyu, Guangzhou, GD, PRC
Postal Code	511483
Phone	0086-20-39196888
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Emergency telephone number

+86-20-39196888

2. HAZARDS IDENTIFICATION

GHS Classification

Not classified

Label elements

Symbols/Pictograms	None
Signal word	None
Hazard Statements	Not classified
Precautionary Statements	
Prevention	None
Response	None
Storage	None
Disposal	None

Hazards not otherwise classified (HNOC)

Batteries may vent, ignite and produce sparks when subjected to high temperature, when damaged or abused (e.g., mechanical damage); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

This product should not present a health hazard when used under reasonable conditions. If contact with the internal components of the battery may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Burning batteries may produce toxic hydrogen fluoride gas. Fumes may cause

dizziness or suffocation.

If the battery is discarded into the environment, the harmful contents inside may be dangerous.

Unknown acute toxicity

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS**Chemical nature**

Article

Chemical Name	CAS No	Weight-%
Nickel	7440-02-0	44.3
Cobalt	7440-48-4	6.0
Manganese	7439-96-5	3.2
Aluminium	7429-90-5	0.7
Nickel hydroxide	12054-48-7	29.1
Polypropylene	9003-07-0	7.1
Steel	7439-89-6	6.7
Cobalt(II) oxide	1307-96-6	2.1
Potassium hydroxide	1310-58-3	0.7
Lithium hydroxide	1310-65-2	0.1

4. FIRST AID MEASURES**Description of first aid measures**

General advice	No effect under routine handling and use. If exposure to internal materials within cells due to damaged outer metal casing, the following actions are recommended.
Inhalation	If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.
Skin Contact	In case of skin contact with contents of battery, flush immediately with water. If irritation persists, get medical help.
Eye contact	For eye contact, flush with copious amounts of water for 15 minutes. Do not inhale leaked material. If irritation persists, get medical help.
Ingestion	Do not induce vomiting. If the injured is fully conscious: wash mouth out with water, then give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Most important symptoms and effects, both acute and delayed

See Section 11 for more information.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE-FIGHTING MEASURES**Extinguishing media**

Suitable extinguishing media Any class of extinguishing medium may be used on the batteries or their packing material.

Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

Exposure to temperatures of above 212°F 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 (cerium, lanthanum neodymium, and praseodymium), manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

No action shall be taken involving any personal risk or without suitable training. Review Section 5 and Section 7 sections before proceeding with clean-up. Use proper personal protective equipment as indicated in Section 8. Appropriate ventilation.

Evacuate and ventilate spill area. Remove all sources of ignition or heat. Stop leak if safe to do so. Move containers from spill area. Keep unnecessary and unprotected personnel from entering. Review Section 5 and Section 7 sections before proceeding with clean-up.

Methods and material for containment and cleaning up

Avoid dispersal of spilled material and runoff and contact with soil, water ways, drains and sewers.

Remove all sources of ignition or heat. Stop leak if safe to do so. Move containers from spill area. Carefully collect undamaged batteries in a clean, dry and appropriate container for reuse or disposal. If electrolyte leaks or spills, collect all released material in an appropriate container before proper disposal.

7. HANDLING AND STORAGE

Precautions for safe 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.

If soldering or welding to the battery is required, use of tabbed batteries is recommended. If this cannot be done, consult your Great Power Battery Company representative for proper precautions to prevent seal damage or short circuit.

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. Here can be a delay between exposure to air and spontaneous combustion.

Conditions for safe storage, including any incompatibilities

Store in a cool and dry area, but prevent condensation on cell or battery terminals. High temperature may damage the performance of the battery. Protect from physical damage and short circuits. To avoid risk of fire or explosion, keep sparks and other sources of ignition away from the battery. Do not allow metal objects to simultaneously contact both positive and negative terminal of batteries. Do not stack battery directly on another battery. Do not store batteries on electrically conductive surfaces.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Denmark	European Union
Nickel hydroxide (CAS #: 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	TWA: 0.05 mg/m ³	-
Foamed Nickel (CAS #: 7440-02-0)	TWA: 1.5 mg/m ³ inhalable fraction	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	IDLH: 10 mg/m ³ IDLH: 10 mg/m ³ Ni TWA: 0.015 mg/m ³ TWA: 0.015 mg/m ³ except Nickel carbonyl Ni	TWA: 0.05 mg/m ³	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m ³ Co	-	-	TWA: 0.01 mg/m ³	-

Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m ³	(vacated) Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	-
Nickel powder (CAS #: 7440-02-0)	TWA: 1.5 mg/m ³ inhalable fraction	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	IDLH: 10 mg/m ³ IDLH: 10 mg/m ³ Ni TWA: 0.015 mg/m ³ TWA: 0.015 mg/m ³ except Nickel carbonyl Ni	TWA: 0.05 mg/m ³ STEL: 0.1 mg/m ³	-

Chemical Name	Latvia	France	Finland	Germany	Italy
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.05 mg/m ³	TWA: 1 mg/m ³	TWA: 0.1 mg/m ³	Skin	-
Foamed Nickel (CAS #: 7440-02-0)	TWA: 0.05 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	Skin	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.5 mg/m ³	-	TWA: 0.02 mg/m ³	Skin	-
Potassium hydroxide (CAS #: 1310-58-3)	-	STEL: 2 mg/m ³	STEL: 2 mg/m ³ Ceiling: 2 mg/m ³	-	-
Nickel powder (CAS #: 7440-02-0)	TWA: 0.05 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	Skin	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.25 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.05 mg/m ³	-
Foamed Nickel (CAS #: 7440-02-0)	TWA: 0.25 mg/m ³	TWA: 1.5 mg/m ³	TWA: 1 mg/m ³	TWA: 0.5 mg/m ³	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	TWA: 0.02 mg/m ³	Skin TWA: 0.05 mg/m ³	-
Potassium hydroxide (CAS #: 1310-58-3)	STEL: 1 mg/m ³ TWA: 0.5 mg/m ³	Ceiling: 2 mg/m ³	STEL: 2 mg/m ³	TWA: 2 mg/m ³	-
Nickel powder (CAS #: 7440-02-0)	TWA: 0.25 mg/m ³	TWA: 1.5 mg/m ³	TWA: 1 mg/m ³	TWA: 0.5 mg/m ³	-

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	TWA: 0.5 mg/m ³	-	-	-
Foamed Nickel (CAS #: 7440-02-0)	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	STEL: 1.5 mg/m ³ TWA: 0.5 mg/m ³	1 mg/m ³	-	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m ³ STEL: 0.06 mg/m ³	TWA: 0.1 mg/m ³	-	Skin	-
Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m ³	STEL: 2 mg/m ³	2 mg/m ³ Peak	TWA: 2 mg/m ³	-
Nickel powder (CAS #: 7440-02-0)	TWA: 0.05 mg/m ³ STEL: 0.15 mg/m ³	STEL: 1.5 mg/m ³ TWA: 0.5 mg/m ³	1 mg/m ³	TWA: 0.5 mg/m ³ STEL: 2 mg/m ³	-

Appropriate engineering controls

General room ventilation is sufficient during normal use and handling. Do not install these batteries in sealed, unventilated areas. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Remove jewelry, rings, watches and any other metallic objects while working on battery. All tools should insulate to avoid the possibility of shorting connections. DO NOT lay tools on top of the battery. The work area should be equipped with the corresponding species and quantity of fire equipment and leakage emergency equipment.

Individual protection measures, such as personal protective equipment

Respiratory protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
Hand Protection	Not necessary under conditions of normal use. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Eye/face protection	Not necessary under conditions of normal use. Wear safety glasses with side shields if handling an open or leaking battery.
Skin and body protection	Under normal condition of use and handling no special protection is required for sealed battery. It is recommended to wear appropriate protective clothing when the battery case is broken.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid
Color	No information available
Odor	Odorless
Odor Threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Boiling point / boiling range	Not determined
Flash point	Not applicable
Evaporation rate	Not determined
Flammability (solid)	Not flammable
Flammability Limit in Air	Not applicable
Vapor Pressure	Not determined
Vapor density	Not applicable
Density	Not determined
Relative density	Not determined
Bulk density	Not determined
Specific gravity	Not determined
Water solubility	Insoluble in water
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not applicable
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

Other information

No information available

10. STABILITY AND REACTIVITY

Reactivity

Stable under recommended storage and handling conditions (see SECTION 7, handling and storage).

Chemical stability

Stable under normal conditions

Possibility of Hazardous Reactions

When a battery cell is exposed to an external short-circuit, crushed, modification, high temperature, open flames, it will be the cause of heat generation and ignition.

Conditions to avoid

Exposed to an external short-circuit, crushed, modification, high temperature, open flames, incompatible materials, direct sunlight and high humidity.

Incompatible materials

Conductive materials, water, seawater, strong oxidants, strong acid, strong bases, etc.

Hazardous Decomposition Products

In case of a fire or high temperature, metal oxides and irritating/harmful fumes/smoke may be generated.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Inhalation	Contents of an open battery can cause respiratory irritation. Hypersensitivity to nickel can cause allergic pulmonary asthma.
Eye contact	Contents of an open battery can cause severe irritation and chemical burns.
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.
Ingestion	Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Information on toxicological effects**Acute toxicity**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Nickel hydroxide (CAS #: 12054-48-7)	-	-	= 1200 mg/m ³ (Rat) 4 h
Foamed Nickel (CAS #: 7440-02-0)	> 9000 mg/kg (Rat)	-	-
Polypropylene (CAS #: 9003-07-0)	>5 g/kg	-	-
Steel (CAS #: 7439-89-6)	98.6 g/kg bw (rat)	-	-
Potassium hydroxide (CAS #: 1310-58-3)	= 333 mg/kg (Rat)	-	-
Nickel powder (CAS #: 7440-02-0)	> 9000 mg/kg (Rat)	-	-

Skin corrosion/irritation

No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in chemical burns.

Serious eye damage/eye irritation

No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in irritation.

Sensitization

No sensitization responses were observed.

Germ cell mutagenicity

No information available

Carcinogenicity

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel hydroxide (CAS #: 12054-48-7)	A1	Group 1	Known	X
Foamed Nickel (CAS #: 7440-02-0)	-	Group 2B	Known Reasonably Anticipated	X
Cobalt(II) oxide (CAS #: 1307-96-6)	A3	Group 2B	-	X
Nickel powder (CAS #: 7440-02-0)	-	Group 2B	Known Reasonably Anticipated	X

Reproductive toxicity
No information available

STOT - single exposure
No information available

STOT - repeated exposure
No information available

Aspiration hazard
No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Foamed Nickel (CAS #: 7440-02-0)	0.18 mg/L/72h Pseudokirchneriella subcapitata 0.174 - 0.311 mg/L/96h Pseudokirchneriella subcapitata static	100 mg/L/96h Brachydanio rerio 1.3 mg/L/96h Cyprinus carpio semi-static 10.4 mg/L/96h Cyprinus carpio static	100 mg/L/48h Daphnia magna 1 mg/L/48h Daphnia magna Static
Steel (CAS #: 7439-89-6)	-	-	> 100 mg/L/48h (Daphnia magna)
Potassium hydroxide (CAS #: 1310-58-3)	-	80mg/L/96h Gambusia affinis static	-
Nickel powder (CAS #: 7440-02-0)	-	15.3 mg/L/96h (Oncorhynchus mykiss)	-

Persistence and degradability
No information available

Bioaccumulative potential
No information available

Mobility in soil
No information available

Other adverse effects
No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging

Contaminated packaging material should be treated equivalent to residual chemical. Clean packaging material should be subjected to waste management schemes (recovery recycling, reuse) according to local legislation. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Foamed Nickel 7440-02-0	-	Included in waste streams: F006, F039	-	-
Nickel powder 7440-02-0	-	Included in waste streams: F006, F039	-	-
Chemical Name		California Hazardous Waste Status		

Foamed Nickel 7440-02-0	Toxic powder Ignitable powder
Cobalt(II) oxide 1307-96-6	Toxic
Potassium hydroxide 1310-58-3	Toxic Corrosive
Nickel powder 7440-02-0	Toxic powder Ignitable powder

14. TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in ‘strong outer packaging’ that prevents spillage of contents. All original packaging for Great Power Nickel Metal Hydride batteries has been designed to be compliant with these regulatory concerns.

Great Power Nickel Metal Hydride batteries (sometimes referred to as ‘dry cell’ batteries) are not defined as hazardous materials (dangerous goods) under International Air Transport Association (IATA) Dangerous Goods Regulations, International Civil Aviation Organization (ICAO) Technical Instructions and U.S. Department of Transportation (DOT) hazardous materials regulations (49 CFR). Nickel Metal Hydride batteries are not defined as dangerous goods under the IMDG code. For air and ground transportation, these batteries are not subject to the dangerous goods regulations as they are compliant with the requirements contained in the following special provisions.

DOT

UN/ID No.	Not regulated
Proper shipping name	Not regulated
Hazard Class	Not regulated
Packing Group	Not regulated
Special precautions	Batteries must be separated from each other and prevent movement that could lead to short-circuits. Products must also be packed in strong packaging that can withstand the rigors normal to transportation.
Marine pollutant	Non-marine pollutant

15. REGULATORY INFORMATION

International Inventories

Component	AICS	DSL/NDL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Nickel hydroxide 12054-48-7 (10 - 30)	X	X	X	X	X	X	X	X
Foamed Nickel 7440-02-0 (7 - 13)	X	X	X	-	X	X	X	X
Polypropylene 9003-07-0 (5 - 10)	X	X	-	X	X	X	X	X
Steel 7439-89-6 (3 - 7)	X	X	X	Expect	X	X	X	X
Cobalt(II) oxide 1307-96-6 (1 - 5)	X	X	X	X	X	X	X	X
Potassium hydroxide 1310-58-3 (0.1 - 1)	X	X	X	X	X	X	X	X
Nickel powder 7440-02-0 (0.1 - 1)	X	X	X	Expect	X	X	X	X

Lithium hydroxide 1310-65-2 (0.1 - 1)	X	X	X	X	X	X	X	X
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"-" Not Listed

"X" Listed

US Federal Regulations

SARA 313

Chemical Name	SARA 313 - Threshold Values %
Nickel hydroxide - 12054-48-7	0.1
Foamed Nickel - 7440-02-0	0.1
Cobalt(II) oxide - 1307-96-6	0.1
Nickel powder - 7440-02-0	0.1

SARA 311/312 Hazard Categories

CWA (Clean Water Act)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel hydroxide 12054-48-7	-	X	-	X
Foamed Nickel 7440-02-0	-	X	X	-
Potassium hydroxide 1310-58-3	1000 lb	-	-	X
Nickel powder 7440-02-0	-	X	X	-

CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Nickel hydroxide 12054-48-7	10 lb	-	RQ 10 lb final RQ RQ 4.54 kg final RQ
Foamed Nickel 7440-02-0	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ
Potassium hydroxide 1310-58-3	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ
Nickel powder 7440-02-0	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ

US State Regulations

California Proposition 65

Chemical Name	California Proposition 65
Nickel hydroxide - 12054-48-7	Carcinogen
Foamed Nickel - 7440-02-0	Carcinogen
Cobalt(II) oxide - 1307-96-6	Carcinogen
Nickel powder - 7440-02-0	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nickel hydroxide 12054-48-7	X	X	X
Foamed Nickel 7440-02-0	X	X	X
Cobalt(II) oxide 1307-96-6	X	-	X
Potassium hydroxide 1310-58-3	X	X	X
Nickel powder 7440-02-0	X	X	X

16. OTHER INFORMATION

Revision Note

Issue Date	16-Apr-2015
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Revision Note	Not applicable

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA - TWA (time-weighted average)

STEL - STEL (Short Term Exposure Limit)

Ceiling - Maximum limit value

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

Disclaimer

The information provided in this Material 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 -----