

# SAFETY DATA SHEET

Ministry of Employment and Labor Public Notice No. 2013-37

Version 1

Product Name Ni-Cd Rechargeable Battery

Issue Date 08-Apr-2015

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

### Product identifier

Product Name Ni-Cd Rechargeable Battery

### Other means of identification

Synonyms No information available

### Recommended use of the chemical and restrictions on use

Recommended Use Used for electronic products

Uses advised against No information available

### Details of the supplier of the safety data sheet

Supplier BST Power(Shenzhen) Limited  
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+86-755-84260300

## 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

<u>Chemical nature</u>	Artile		
Chemical Name		CAS No	Weight-%
Cadmium oxide		1306-19-0	35
Nickel hydroxide		12054-48-7	30
Iron		7439-89-6	15
Water		7732-18-5	12
Cobalt(II) oxide		1307-96-6	8

### 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 inhaled, remove from exposure and move to fresh air immediately. Rinse mouth and nose with water. Get medical aid immediately. DO NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device.
Skin Contact	In case of contact, immediately flush skin with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing and shoes before reuse. Get medical aid.
Eye contact	Rinse immediately with plenty of water during at least 15-30 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses if easily possible. DO NOT rubbing eyes with hand. Get medical aid immediately.
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 and supportively.

### 5. FIRE-FIGHTING MEASURES

#### Extinguishing media

Suitable extinguishing media	Dry sand or Class D extinguishing agents. If the battery is burning, water can also be submerged ignition ground.
Unsuitable extinguishing media	No information available.

#### Specific hazards arising from the chemical

Toxic vapor may release in case of fire. Thermal shock may cause battery case to crack open. Containers may explode when heated. Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts. On some bad using conditions (e.g., mechanical damage, external short circuit.) and in case of a bad functioning, some electrolyte can be removed from the cell by the security vent. Exposure to the ingredients contained within the battery pack could be harmful under some circumstances.

#### 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**

This product should be stored, handled and used in accordance with good industrial hygiene practices and in conformity with any legal regulation. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

### **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
Cadmium oxide (CAS #: 1306-19-0)	TWA: 0.01 mg/m <sup>3</sup> Cd TWA: 0.002 mg/m <sup>3</sup> Cd respirable fraction	-	IDLH: 9 mg/m <sup>3</sup> Cd fume IDLH: 9 mg/m <sup>3</sup> Cd dust and fume	TWA: 0.005 mg/m <sup>3</sup>	-
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.2 mg/m <sup>3</sup> Ni inhalable fraction	TWA: 1 mg/m <sup>3</sup> Ni (vacated) TWA: 1 mg/m <sup>3</sup> Ni	IDLH: 10 mg/m <sup>3</sup> Ni TWA: 0.015 mg/m <sup>3</sup> except Nickel carbonyl Ni	TWA: 0.05 mg/m <sup>3</sup>	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m <sup>3</sup> Co	-	-	TWA: 0.01 mg/m <sup>3</sup>	-

Chemical Name	Latvia	France	Finland	Germany	Italy
Cadmium oxide (CAS #: 1306-19-0)	TWA: 0.01 mg/m <sup>3</sup> STEL: 0.05 mg/m <sup>3</sup>	TWA: 0.05 mg/m <sup>3</sup> STEL: 0.05 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup> TWA: 0.01 mg/m <sup>3</sup> Skin	Skin	-
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.05 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup>	Skin	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.5 mg/m <sup>3</sup>	-	TWA: 0.02 mg/m <sup>3</sup>	Skin	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Cadmium oxide (CAS #: 1306-19-0)	TWA: 0.01 mg/m <sup>3</sup> TWA: 0.002 mg/m <sup>3</sup>	TWA: 0.002 mg/m <sup>3</sup>	TWA: 0.01 mg/m <sup>3</sup> TWA: 0.002 mg/m <sup>3</sup>	Skin TWA: 0.002 mg/m <sup>3</sup> TWA: 0.015 mg/m <sup>3</sup>	TWA: 0.005 mg/m <sup>3</sup>
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.25 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.05 mg/m <sup>3</sup>	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.02 mg/m <sup>3</sup>	Skin TWA: 0.05 mg/m <sup>3</sup>	-

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium

Cadmium oxide (CAS #: 1306-19-0)	TWA: 0.05 mg/m <sup>3</sup> Ceiling: 0.02 mg/m <sup>3</sup> STEL: 0.15 mg/m <sup>3</sup>	STEL: 0.05 mg/m <sup>3</sup> TWA: 0.025 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	-	-
Nickel hydroxide (CAS #: 12054-48-7)	TWA: 0.05 mg/m <sup>3</sup> STEL: 0.15 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	-	-	-
Cobalt(II) oxide (CAS #: 1307-96-6)	TWA: 0.02 mg/m <sup>3</sup> STEL: 0.06 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup>	-	Skin	-

### 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	Under normal condition of use and handling no special protection is required for sealed battery. In the event of battery case breakage, should be wear appropriate safety gloves.
Eye/face protection	Under normal condition of use and handling no special protection is required for sealed battery. Use appropriate safety glasses when there is the risk of splash.
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	White
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, gas)	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	No effect under routine handling and use for sealed battery. If battery is broken, inhale fume and dust may cause upper respiratory irritation and lung irritation.
Eye contact	No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in irritation.
Skin Contact	No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in chemical burns.
Ingestion	No effect under routine handling and use for sealed battery. Harmful if swallowed the electrolyte contained inside the battery. Exposure to the electrolyte contained inside the battery may cause irritation to mouth, esophagus and gastrointestinal system.

**Information on toxicological effects****Acute toxicity**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Cadmium oxide (CAS #: 1306-19-0)	= 72 mg/kg (Rat)	-	-
Nickel hydroxide (CAS #: 12054-48-7)	-	-	= 1200 mg/m <sup>3</sup> (Rat) 4 h
Iron (CAS #: 7439-89-6)	98.6 g/kg bw (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
Cadmium oxide (CAS #: 1306-19-0)	A2	Group 1	Known	X
Nickel hydroxide (CAS #: 12054-48-7)	A1	Group 1	Known	X
Cobalt(II) oxide (CAS #: 1307-96-6)	A3	Group 2B	-	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
Iron (CAS #: 7439-89-6)	-	-	> 100 mg/L/48h (Daphnia magna)

**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	California Hazardous Waste Status

Cadmium oxide 1306-19-0	Toxic
Cobalt(II) oxide 1307-96-6	Toxic

## 14. TRANSPORT INFORMATION

### 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	Not applicable

## 15. REGULATORY INFORMATION

### International Inventories

Component	AICS	DSL/NDL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Cadmium oxide 1306-19-0 ( 35% )	X	X	X	X	X	X	X	X
Nickel hydroxide 12054-48-7 ( 30% )	X	X	X	X	X	X	X	X
Iron 7439-89-6 ( 15% )	X	X	X	Expect	X	X	X	X
Water 7732-18-5 ( 12% )	X	X	X	Expect	X	X	X	X
Cobalt(II) oxide 1307-96-6 ( 8% )	X	X	X	X	X	X	X	X

"-" Not Listed

"X" Listed

### US Federal Regulations

#### SARA 313

Chemical Name	SARA 313 - Threshold Values %
Cadmium oxide - 1306-19-0	0.1
Nickel hydroxide - 12054-48-7	0.1
Cobalt(II) oxide - 1307-96-6	0.1

#### SARA 311/312 Hazard Categories

No information available

#### CWA (Clean Water Act)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Cadmium oxide 1306-19-0	-	X	-	-
Nickel hydroxide 12054-48-7	-	X	-	X

#### CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Cadmium oxide 1306-19-0	-	100 lb	-
Nickel hydroxide 12054-48-7	10 lb	-	RQ 10 lb final RQ RQ 4.54 kg final RQ

### US State Regulations

**California Proposition 65**

Chemical Name	California Proposition 65
Cadmium oxide - 1306-19-0	Carcinogen
Nickel hydroxide - 12054-48-7	Carcinogen
Cobalt(II) oxide - 1307-96-6	Carcinogen

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Cadmium oxide 1306-19-0	X	X	X
Nickel hydroxide 12054-48-7	X	X	X
Cobalt(II) oxide 1307-96-6	X	-	X

**16. OTHER INFORMATION****Revision Note**

Issue Date	08-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 -----