



Test Center of National Engineering Research Center of  
Advanced Energy Storage Materials Co., Ltd.

## MATERIAL SAFETY DATA SHEET

Name of Sample : Ni-Cd Rechargeable Battery

Applicant : BST POWER (SHENZHEN) LIMITED  
Building C, D&3F Of Building A, No.37, Xinlong  
Road, Dakang Community, Henggang Street,  
Longgang District, Shenzhen City, Guangdong  
Province, P. R. China

Manufacturer : BST POWER (SHENZHEN) LIMITED  
Building C, D&3F Of Building A, No.37, Xinlong  
Road, Dakang Community, Henggang Street,  
Longgang District, Shenzhen City, Guangdong  
Province, P. R. China

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Approved by:

Cherry Chen

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# MATERIAL SAFETY DATA SHEET

## Section 1. Chemical Product and Company Identification

**Products Name:** Ni-Cd Rechargeable Battery

**Model Number:** D-AA, D-2/3AA, D-1/3AA, D-A, D-AAA, D-C, D-D, D-1/2D, D-SC, D-F

**Rating:** Nominal Voltage: 1.2V/Cell

**Manufacture Name:** BST POWER (SHENZHEN) LIMITED

**Address:** Building C, D&3F Of Building A, No.37, Xinlong Road, Dakang Community, Henggang Street, Longgang District, Shenzhen City, Guangdong Province, P. R. China

**Telephone No.:** 0755-84260300

**Fax:** 0755-84260306

**E-mail:** yzl@bstbattery.com

## Section 2. Composition/Information on Ingredients

Substance/preparation: preparation		
Chemical Name	CAS No.	Concentration%
Nickel hydroxide	12054-48-7	23-27
Cobalt oxide	11104-61-3	1-2
Cadmium	7440-43-9	9-11
Cadmium oxide	1306-19-0	25-28
Graphite	7782-42-5	0.2-0.4
Sodium hydrogen phosphate	7558-79-4	0.2-0.4
The diaphragm	31175-20-9	3.8-4.5
Carboxymethyl cellulose	9004-32-4	0.1-0.3
Ploy(tetrafluoroethylene)	9002-84-0	0.7-0.9
Ploy(vinyl alcohol)	9002-89-5	0.1-0.3
Styrene 1,3-butadiene polymer	9003-55-8	0.1-0.2
Nickel	7440-02-0	4-5
Sodium hydroxide	1310-73-2	4-5
Pstassium hydroxide	1310-58-3	0.4-0.6
Water	7732-18-5	16-19

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Cobalt	7440-48-4	0.4-0.6
Zinc	7440-66-6	0.7-0.9

### Section 3. Hazardous description

**Inhalation:** During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach in the battery cell case, exposure to the constituents may occur. skin and eyes will be heat injured when contacted with the substances contained in the battery, because it is strongly corrosive. Take it by accident can cause chemical burn of the alimentary canal, anabrosis and bleeding of the mucous membrane, and shock. Nickel compounds are carcinogenic. Cobalt compounds could cause erythremia, cardiomyopathy and goiter.

**Ingestion:** If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.

**Skin Absorption:** No evidence of adverse effects from available data.

**Skin Contact:** Exposure to the electrolyte contained inside the battery may result in chemical burns. 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.

**Carcinogenicity:** Nickel has been identified by the National Toxicology Program (NTP) as reasonably anticipated to be a carcinogen. Cobalt has been identified by IARC as a 2B carcinogen.

**Other Effects of Repeated (Chronic) Exposure:** Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.

**Medical Conditions Aggravated by Overexposure:** A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

### Section 4. First Aid Procedures

**Swallowing:** Do not induce vomiting. Seek medical attention immediately.

**Skin:** If the internal cell materials of an opened battery cell comes into contact with the skin, immediately flush with water for at least 15 minutes.

**Inhalation:** If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

**Eyes:** If the contents from an opened battery comes into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

### Section 5. Fire fighting Procedures

**Extinguishing Media:** Any class of extinguishing medium may be used on the batteries or their packing material.

Fire Fighting Procedures: Exposure to temperatures of above 100°C can cause evaporation of the liquid content of the alkalinity electrolyte resulting in the rupture of the cell. Potential for exposure to metal alloy fumes during fire; use self-contained breathing apparatus.

## Section 6. Spill and Leak Procedures

Spill and leaks are unlikely because cells are contained in a hermetically-sealed case. If the battery case is breached, do protective clothing that is impervious to caustic materials and absorb or pack spill residues in inert material. Dispose of as a hazardous waste in accordance with applicable state and federal regulations. Resultant spill residues may be characterized as caustic. See Section VII for response to fires or explosions. If there is a great deal leaked, collect and transport them to the professional waste treatment, and wash the ground with plenty of water which should be flushed to the waste water system.

## Section 7. Precautions for Safe Handling and Use

Storage: Store in a cool place, but prevent condensation on cell or battery terminals. Elevated temperatures may result in reduced battery life. Optimum storage temperatures are between -20°C and 40°C. Optimum storage humidity are 65±20%.

Mechanical Containment: If there are special encapsulation or sealing requirements, consult your McNair company representative about possible cell hazard precautions or limitations.

Handling: Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case. Batteries packaged in bulk containers should not be shaken. Metal covered tables or belts used for assembly of batteries into devices can be the source of short circuits; apply insulating material to assembly work surface. If soldering or welding to the case of the battery is required, consult your McNair company representative for proper precautions to prevent seal damage or external short circuit.

Charging: This battery is designed for recharging. A loss of voltage and capacity of batteries due to self-discharge during prolonged storage is unavoidable. Charge battery before use. Observe the specified charge rate since higher rates can cause a rise in internal gas pressure that may result in damaging heat generation or cell rupture and/or venting.

Labeling: If normal label warnings are not visible, it is important to provide a device label stating: CAUTION: Do not dispose in fire, mix with other battery types, charge above specified rate, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

Soldering/welding: If soldering or welding to the case of the battery is required, consult your McNair company representative for proper precautions to prevent seal damage or external short circuit.

## Section 8. Safe Handling and Use /Person Protection

Threshold Limit Values: See Section III.

Ventilation Requirements: Not required under normal use.

Respiratory Protection: Not required under normal use.

Eye Protection: Not required under normal use.

Gloves: Not required under normal use.

## Section 9. Physical/ Chemical Characteristics

External appearance: White cylindrical.

Relative Density (Water=1): Not applicable

Relative Vapor Density(Air=1): Not applicable

Solubility in Water: Insoluble

Flash Point: Not applicable

Lower Explosive Limit: Not applicable

Upper Explosive Limit: Not applicable

## Section 10. Stability and Reactivity

The batteries are stable under normal operating conditions.

Hazardous polymerization will not occur.

Hazardous decomposition products: oxides of nickel , cobalt and Cadmium.

Conditions to avoid: heat, open flames, sparks, and moisture.

Potential incompatibilities (i.e., materials to avoid contact with): The battery cells are encased in a non-reactive container; however, if the container is breached, avoid contact of internal battery components with acids, aldehydes, and carbamate compounds.

## Section 11. Toxicology Data

During normal use, hazardous materials are fully contained inside the battery cell. However, If the battery case is breached, hazardous materials may be released. The following information is provided for the user's information only.

Acute toxicity: Cobalt oxide: LD50: 1700 mg/kg (Swallowing of big mouse)

Cadmium oxide: LD50: 72 mg/kg (Swallowing of small mouse)

Nickel hydroxide: LD50: 1500 mg/kg (Swallowing of big mouse)

## Section 12. Ecological Information

Other hazardous effect: During normal use, It is not hazardous. If the battery case is breached, the substances inside the battery is hazardous to the environment. There should especially pay attention to the pollution to the waters.

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## Section 13. Recycling and Disposal

Cell encourages battery recycling. Our nickel-cadmium battery are recyclable through the professional waste disposal company. nickel-cadmium batteries must be handled in accordance with all applicable state and federal laws and regulations.

Don't incinerate or subject battery cells to temperatures in excess of 100°C. Such treatment can vaporize the liquid electrolyte causing cell rupture. Incineration may result in metal alloy fumes emissions.

## Section 14. Transportation Information

This battery is a nickel-cadmium Battery, it belongs to non-spillable battery. According to the IMDG (inc Amdt 40-20) and the special provision A123 of 2023 IATA DGR 64th edition, this battery can be classified as "NOT RESTRICTED", "This entries applies to Batteries, electric storage, not otherwise listed in Subsection 4.2 – List of Dangerous Goods. Any electrical battery or battery powered device having the potential of dangerous evolution 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 transport." As of 1/1/97 IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

## Section 15. Statute Information

Statute information: No detail definite Rules issued by the Government.

## Section 16. Other Information

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Cell company makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

-- End of the Report --