

## **MATERIAL SAFETY DATA SHEET (MSDS) FOR NICKEL METAL HYDRIDE BATTERIES**

### 1. PRODUCT IDENTIFICATION

Applicable Products Sizes: Rechargeable batteries of sizes AAAA, AAA, AA, SC, N, C, D, 9V block and all types of prismatic cells.

Voltage: 1.2V / cell

Product Name: Rechargeable Nickel Metal Hydride Batteries

Chemical System: Nickel Metal Hydride series

HS code: 85075000

### 2. HAZARDS IDENTIFICATION

**IMPORTANT NOTES:** The battery should not be opened, burned, or disassembled. Exposure to the ingredient contained within or products formed by their combustion could be harmful

### 3. COMPOSITION ON INGREDIENTS

Ingredient	Wt. (%)	CAS#
Nickel	30~50	7440-02-0
Nickel hydroxide, nickel oxide, etc.	40~45	14332-32-2
Cobalt	2.5~6.0	7440-48-4
Zinc	<0.8	7440-66-6
Lithium hydroxide	<1.0	1310-66-3
Potassium hydroxide	<4.0	1310-58-3
Sodium hydroxide	<0.1	1310-73-2
Graphite	<0.1	7782-42-5
PTFE	<0.01	9002-84-0

### 4. FIRST-AID MEASURES

Swallowing: Do not induce vomiting, seek medical attention immediately

Skin: Immediately flush with water for at least 15 min. if the internal cell material of an opened battery cell comes into contact with skin.

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

Eyes: Immediately flush eyes with water for at least 15 min. if the internal cell material of an opened battery cell comes into contact with eyes.

### 5. FIREFIGHTING MEASURES

Once fire occurs during the batteries are being charged, disconnect the charging power. If fire occurs where nickel hydride batteries are present, sand, dry ground dolomite, or soda ash are applied onto the area of fire. The area is cooled down by flooding of water. Water cannot extinguish burning of batteries but is used for cooling the adjacent areas. But when water is used, hydrogen gas may evolve. Hydrogen gas can form explosive mixtures. Smothering agents are recommended in this situation. This agent is also helpful in extinguishing burning nickel hydroxide batteries. Once the batteries are burnt, the batteries will combust

completely. Fire fighters should wear self-contained breathing apparatus because burning nickel metal hydroxide batteries may produce toxic fumes including oxides of nickel, cobalt, lanthanum, etc..

6. ACCIDENTAL RELATE MEASURES (ACCIDENTAL RELEASE OR SPILLAGE)

Spill and leaks are unlikely because cells are contained in a hermetically-sealed case. If the battery case is breached, use protective clothing that is impervious to caustic material and absorb or pack spill residues in inert material. Dispose in accordance with applicable state and federal regulations.

7. HANDLING & STORAGE (PRECAUTIONS SAFE HANDLING & USE)

Storage: Store in a cool, well-ventilated area elevated temperature may reduce the battery life.

Handling: This battery is capable of delivering very high short circuiting current. Prolonged short circuiting will cause high cell temperatures which can cause skin burns. Sources of short circuiting include jumbled batteries in bulk containers, metal jewellery, and metal covered tables or metal belts used for assembly of batteries in devices. Direct soldering is not recommended. Welding to the battery is required and resistance welding is preferred in this situation. Do not open the battery. Batteries packing in bulk containers should not be shaken..

8. EXPOSURE CONTROLS (PERSONAL PROTECTION)

Under normal use, ventilation, respiratory protection, eye protection and gloves are not required.

9. PHYSICAL & CHEMICAL PROPERTIES

The cell is contained in a hermetically-sealed case, designed to withstand temperatures and pressure encountered during normal use.

NiMH batteries act as a DC power source with voltage of 1.20V. It does not provide other chemical functions or physical functions.

10. STABILITY & REACTIVITY (REACTIVITY DATA)

Hazardous polymerization will not occur. Hazardous decomposition products would be oxides of nickel, cobalt, lanthanum, etc..

Conditions of heat, open flames, sparks and moisture are avoided.

11. TOXICOLOGICAL INFORMATION (HEALTH HAZARD DATA)

If battery or open battery is ingested, do not induce vomiting of the mouth or give food or drink. Seek medical care immediately. Contents of an open battery can cause serious chemical burns of mouth, esophagus and gastrointestinal tract.

12. ECOLOGICAL INFORMATION (FREE & EXPLOSION HAZARD DATA)

Flash point: N/A Lower explosive limit: N/A Upper explosive limit: N/A

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

13. DISPOSAL CONSIDERATION (DISPOSAL METHOD)

Batteries produced by Linghao can be disposed or recycled under local government regulation, i.e. EU

regulations and RBRC regulations in North America.

#### 14. TRANSPORT INFORMATION

NiMH batteries are non-dangerous and non-hazardous materials for sea and air transportation in any nature.

For international transport of NiMH batteries, they comply with those regulations:

- Non-dangerous goods as they comply to Special Provision 963 under the International Maritime Dangerous Goods (IMDG), Amendment 34-08 by IMO.
- Non-dangerous goods classification under the current edition of IATA Dangerous Goods Regulation (56<sup>th</sup> edition) Special Provision A123 to all applicable carrier and governmental regulation.

#### 15. REGULATORY INFORMATION

NiMH batteries are not subject to dangerous goods regulation for the purpose of transportation.

NiMH batteries should be stored in cool and ventilated environment with ambient temperature which is lower than 40°C and must be protected from short-circuiting during transportation.

#### 16. OTHER INFORMATION

The goods is packed such as to prevent short circuits and to prevent movement while would lead to short circuit, and in proper condition for carrier by air or by sea.

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