Section I: Information of Manufacturer

Manufacturer's Name (生产商): McNair Technology Co., Ltd （迈科科技有限公司）

Address: Menair Industrial Estate, 1888 West of MeiJing Road, DaLang Town, DongGuan City, GuangDong Province, CHINA （中国广东省东莞市大郎镇美景大道西1888号迈科工业园）

Telephone number/ FAX number: TEL:0086-769-83197555 FAX: 0086-769-83195372

WEB: www.mcnair.com.cn

Section II: Name of the chemical

Chinese name of the chemical: 镍氢电池
English name of the chemical: Nickel Metal Hydride Battery
Second Chinese name: 氢镍电池

Technical Specification No.: N.A

CAS No.: N.A, Could consult the CAS number of the substances contained in the battery

Molecular formula: Ni-MH Molecular weight: uncertain

Section III: Ingredients / Identity Information

Important note: The battery should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances. The following information is provided for the user's information only.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS NO.</th>
<th>wt%</th>
<th>MAC(mg/m3)/China</th>
<th>MAC(mg/m3)/USSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt Oxide</td>
<td>1307-96-6</td>
<td>2–6</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Nickel Hydroxide</td>
<td>12054-48-7</td>
<td>23–28</td>
<td>0.5</td>
<td>0.05</td>
</tr>
<tr>
<td>Hydrogen absorbing alloy</td>
<td>N.A</td>
<td>30–35</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>&lt;2</td>
<td>N.A</td>
<td>0.5</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>&lt;1</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Lithium hydroxide</td>
<td>1310-66-3</td>
<td>&lt;1</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Paper</td>
<td>N/A</td>
<td>&lt;1</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Steel Casing</td>
<td>N/A</td>
<td>20–25</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Plastic</td>
<td>N/A</td>
<td>&lt;1</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
<td>&lt;1</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. Weight % listed is based on approximate percent of the average weight of the battery (14 grams).
2. The components in this section may only represent a hazard if the integrity of the battery is compromised.

Section IV: Physical / Chemical Characteristics

The battery is contained in a hermetically-sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. However, if exposed to a fire, explosion, extreme abuse, misuse, or improper disposal that results in breaching of the battery cell case, hazardous materials may be released. The following physical data relating to the hazardous materials contained within the battery are provided for the user's information.

**Cobalt oxide**
- Melting point (°C): 1935
- Boiling point (°C):
- % Volatile by Volume:

**Nickel hydroxide**
- Melting Point (°C):
- Boiling Point (°C):
- % Volatile by Volume:
### Hydrogen absorbing alloy

- **Melting point (°C):**
- **Boiling point (°C):**
- **% Volatile by Volume:**
- **Vapor Pressure (kPa):**
- **Evaporation Rate:**
- **Vapor Density (Air =1):**
- **Specific Gravity (H2O):**
- **Solubility:** Soluble in Water and grain alcohol
- **Appearance and Odor:** White powder

### Potassium hydroxide

- **Melting point (°C):** *360.4
- **Boiling Point (°C):** 1320
- **% Volatile by Volume:**
- **Vapor Pressure (kPa):** 0.13(719°C)
- **Evaporation Rate:**
- **Vapor Density (Air = 1):**
- **Specific Gravity (H2O):** 2.04
- **Solubility:** Soluble in Water and grain alcohol
- **Appearance and Odor:** White crystal

  * Note: Potassium hydroxide is present as a liquid or paste and acts as the electrolyte in the battery cell.

### Sodium hydroxide

- **Melting point (°C):** *318.4
- **Boiling Point (°C):** 1390
- **% Volatile by Volume:**
- **Vapor Pressure (kPa):** 0.13(739°C)
- **Evaporation Rate:**
- **Vapor Density (Air =1):**
- **Specific Gravity (H2O):** 2.12
- **Solubility:** Soluble in Water and grain alcohol
- **Appearance and Odor:** White solid

  * Note: Sodium hydroxide is present as a liquid or paste and acts as the electrolyte in the battery cell.

### Lithium hydroxide

- **Melting point (°C):** *471.2
- **Boiling Point (°C):** 1626
- **% Volatile by Volume:**
- **Vapor Pressure (kPa):**
- **Evaporation Rate:**
- **Vapor Density (Air =1):**
- **Specific Gravity (H2O):** 2.54
- **Solubility:** Soluble in Water, slightly soluble in grain alcohol
- **Appearance and Odor:** White powder

  * Note: Lithium hydroxide is present as a liquid or paste and acts as the electrolyte in the battery cell.

### Section V: 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 erythema, 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.
**Section VI: 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 VII: 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 alkaline electrolyte resulting in the rupture of the cell. Potential for exposure to metal alloy fumes during fire; use self-contained breathing apparatus.

**Section VIII: 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 IX: 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 35°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 X: 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 XI: Physical/ Chemical Characteristics**

External appearance: Silvery white metal shell
Relative Density (Water=1): N.A
Relative Vapor Density(Air=1): N.A
Solubility in Water: Insoluble
Flash Point: N.A
Lower Explosive Limit: N.A
Upper Explosive Limit: N.A

**Section XII: Stability and Reactivity**

The batteries are stable under normal operating conditions.
Hazardous polymerization will not occur.
Hazardous decomposition products: oxides of nickel and cobalt.
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 XIII: 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)
Nickel hydroxide: LD50: 1500 mg/kg (Swallowing of big mouse)

**Section XIV: 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.

**Section XV: Recycling and Disposal**

McNair encourages battery recycling. Our Nickel Metal Hydride batteries are recyclable through the professional waste disposal company. Nickel Metal Hydride batteries must be handled in accordance with all applicable state and federal laws and regulations. Production of MSDS providing UN Manual of Test and Criteria, Part III, sub-section 38.3 is met.

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 XVI: Transportation Information**

McNair sealed Nickel Metal Hydride batteries are considered to "dry cell" batteries and not subject to hazardous materials (dangerous goods) regulations for the purpose of transportation by the U.S. Department of Transportation (DOT), the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) or the International Maritime Organization (IMO).
The only DOT requirement for shipping Nickel Metal Hydride batteries are contained in Special Provision 130 which states, "Batteries, dry" are not subject to the requirements of this subchapter when they are securely packaged and offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals) and protects against short circuits." A similar requirement is contained in 49 CFR 173.21(c) of the U.S. DOT hazardous materials regulations.

The IATA Dangerous Goods Regulations contain a similar requirement in Special Provision A123 that states, "This entries applies to Batteries, electric storage, not otherwise listed in Subsection 4.2 – List of Dangerous Goods. Examples of such batteries are alkali-manganese, zinc-carbon, nickel-metal hydride, and nickel cadmium batteries. 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. Codes and classifications according to international regulations for transport air ITAT-DGR:special provision A45((a)-(e)).

Failure to comply with these requirements may result in substantial civil penalties.

**Section XVII: Statute Information**

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

**Section XVIII: Other Information**

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