

## MATERIAL SAFETY DATA SHEET

### Nickel Metal Hydride Battery

#### SECTION I – NAME AND PRODUCT

Manufactured for:  
 Separation Technology, Inc.  
 1096 Rainer Dr.  
 Altamonte Springs, FL 32714  
 (407) 788-8791/(407) 788-3677 (Fax)

Product Name: Nickel Metal Hydride Battery  
 Chemical System: Nickel Metal Hydride-AB5  
 Nominal Voltage: 1.2V  
 Designated for Recharge

#### SECTION II – HAZARDOUS INGREDIENTS

**IMPORTANT NOTICE:**

The product is a manufactured article. The battery cell is contained in a hermetically sealed case, designed to withstand the temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. The battery cell 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 convenience only.

Chemical Name	Case No.	OSHA PEL (mg/m <sup>3</sup> )	ACGIH TLV (mg/m <sup>3</sup> )
Nickel (powder)	7440-02-0	1TWA	1TWA
Nickel Hydroxide	12054-48-7	1TWA	1TWA
Cobalt	7440-48-4	0.1TWA	Dust & Fume: 0.05
Manganese	7439-96-5	Fume: 5 Ceiling Limit	Dust: 5 Fume: 1
Lanthanum	7439-91-0	NA	NA
Cerium	7440-45-1	NA	NA
Neodymium	7440-00-8	NA	NA
Potassium hydroxide	1310-58-3	NA	2 Ceiling Limit
Sodium hydroxide	1310-73-2	2TWA	2 Ceiling Limit
Lithium hydroxide	1310-65-2	NA	NA

**Notes:**

- Concentrations vary depending on the state of charge or discharge.
- TWA is the time weighted average concentration over an 8-hour period.

#### SECTION III – PHYSICAL DATA FOR BATTERY

Boiling Point: (°F):	N/A	% Volatile by Volume:	N/A
Melting Point (°F):	N/A	Appearance & Odor:	No odor.
Vapor Pressure (mmHg):	N/A	Vapor Density (Air=1):	N/A
Solubility in Water:	N/A	Specific Gravity (H <sub>2</sub> O):	N/A
Evaporation Rate:	N/A		

#### SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point:	N/A °F
Lower Explosive Limit:	N/A
Upper Explosive Limit:	N/A
<u>Extinguishing Media:</u>	Any class of extinguishing medium may be used on the batteries or their packing material .
<u>Special Firefighting Procedures:</u>	Exposure to temperatures above 212°F can cause venting of the liquid electrolyte. Internal shorting could also cause venting of the electrolyte. 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.

#### SECTION V – HEALTH HAZARD DATA

<u>Threshold Limit Values:</u>	See Section II
<u>Effects of a Single (Acute) Overexposure:</u>	
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. Inhalation of cobalt dusts may result in pulmonary conditions.
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 a chemical burn. 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.
<u>Carcinogens:</u>	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.
<u>Other Effects of Repeated (Chronic) Exposure:</u>	Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.
<u>Medical Conditions Aggravated by Overexposure:</u>	A knowledge of the available toxicology information and of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

Emergency and First Aid Procedures:

Swallowing:	Do not induce vomiting. Seek medical attention immediately.
Skin:	If the internal cell materials of a 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 dust 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 VI- STABILITY AND REACTIVITY**

The batteries are stable under normal operating conditions.

Hazardous Polymerization:	Will not occur.
Hazardous Products of Decomposition:	Oxides of nickel, manganese, lanthanum, and cerium.
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 carbonate compounds

**SECTION VII – SPILL AND LEAK PROCEDURES**

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

**SECTION VIII – SAFE HANDLING AND USE (PERSONAL PROTECTIVE EQUIPMENT)**

Respiratory Protection:	Not required under normal use.
Ventilation Requirements:	Not required under normal use.
Protective Gloves:	Not required under normal use.
Eye Protection:	Not required under normal use.

**SECTION IX – PRECAUTIONS FOR SAFE HANDLING AND USE**

<u>Storage:</u>	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 -31°F and 95°F.
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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. Battery shrink wrap, labels, and insulators should be left intact in order to minimize the chance of short circuiting.

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 which 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.

#### SECTION X – DISPOSAL INFORMATION

Disposal: Dispose in accordance with all applicable state and federal laws and regulations.

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F. Such treatment can cause cell rupture.

The above information has been obtained from sources considered reliable but has not been independently verified and, therefore, we can not guarantee the accuracy of the information. No representation or warrant, express or implied, is made with respect to the information contained herein.