



Ni-MH – Material Safety Data Sheet

Sealed Energy Systems

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**Product: Nickel Metal Hydride
Battery (NiMH)**

Applicable model / size: All

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The batteries referenced herein are exempt articles and are not subject to the OSHA Hazard Communication Standard requirement. This sheet is provided as a service to our customers.

MSDS

Material Safety Data sheets (MSDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle : (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as "articles" they are exempt from the requirements of the Hazard Communication Standard, hence a MSDS is not required. This sheet is provided as a service to our customers.

Section I – HAZARDOUS INGREDIENTS

IMPORTANT NOTE :

The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

(A) The content of elements are based on homogeneous materials level of NiMH Battery:

Element	Lead	Cadmium	Hexavalent Chromium (Cr ₆₊)	Mercury	Polybrominated Biphenyl (PBDEs)	Polybrominated Diphenyls Ethers (PBDEs)
% W.t.	< 0.1	<0.01	<0.1	<0.1	<0.1	<0.1

(B) The content of elements are based on total weight of NiMH battery:

MATERIAL OR INGREDIENTS	%W.t.
Nickel as nickel hydroxide nickel oxide nickel powder	30-50
Potassium Hydroxide	<20
Cobalt as cobalt metal cobalt oxide cobalt hydroxide	2.5-6.0
Sodium Hydroxide	<20
Zinc as zinc metal	<3



zinc oxide zinc hydroxide	
Mercury	0-0.0005
Lead as lead metal lead oxide	0-0.004
Cadmium as cadmium metal cadmium oxide cadmium hydroxide	<0.002
Hexavalent Chromium (Cr ⁶⁺)	0-0.0005
Polybrominate Biphenyls (PBBs)	Nil
Polybrominated Diphenyls Ethers(PBDEs)	Nil

SECTION II – PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point N.A	Specific Gravity (H ₂ O =1) N.A.
Vapor Pressure (mm Hg) N.A	Melting Point N.A.
Vapor Density (AIR =1) N.A.	Evaporation rate (Butyl Acetate) N.A.
Solubility in water N.A	
Appearance and Odor Cylindrical shape, odorless	

SECTION III – REACTIVITY DATA

Stability	Unstable		Condition to Avoid
	Stable	X	
Incompatibility (Materials to Avoid)			
Hazardous Decomposition or Byproducts			
Hazardous Polymerization	May Occur		Condition to Avoid
	Will Not Occur	X	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

If fire explosion occurs when batteries are on charge, shut off to charger.

In case of fire, where nickel metal hydride batteries are present, apply a smothering agent such as METL –X, sand, dry ground dolomite, or soda ash, or flood the area with water. A smothering agent will extinguish nickel metal hydride batteries. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving nickel metal hydride space, hydrogen gas can form an explosive mixture. In this situation agent are recommended.

Fire fighters wear self –contained breathing apparatus. Burning nickel metal hydride batteries can produce toxic fumes including oxides nickel, cobalt, aluminum, manganese, lanthanum, cerium, neodymium, and praseodymium.

SECTION V – HEALTH HAZARD DATA

Under normal condition of use, the battery is hermetically sealed.



Ingestion :

Swallowing a battery can be harmful.

Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Inhalation :

Content of an open battery can cause respiratory irritation. Hypersensitivity to nickel cause allergic pulmonary asthma. Provide fresh air and seek medical attention.

Skin Contact:

Contents of an open battery can cause skin irritation and / or chemical burns. Nickel, nickel compounds, cobalt, and cobalt compounds can cause skin sensitization and an allergic contact dermatitis. Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.

Eye Contact:

Contact of an open battery can cause severe irritation and chemical burn. Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no chemical remains. Seek medical attention.

SECTION VI – PRECAUTION FOR SAFE HANDLING AND USE

Store in cool, well ventilated area. Elevated temperatures can result in shortened battery life.

Mechanical Containment:

- Never seal or encapsulate nickel metal hydride batteries.
- Do not obstruct safety release vent on batteries. Encapsulation (potting) of batteries will not allow cell venting and can cause high pressure rupture.

Handling:

- Accident short circuit for a few seconds will not seriously affect the battery. However, this battery is capable of delivering very high short circuit currents. Prolonged short circuits will cause high cell temperatures which can cause skin burns. Sources of short circuit include jumbled batteries in bulk containers, metal jewelry, and metal covered tables or metal belts used for assembly of batteries into devices.
- Do not open battery. The negative electrode material may be pyrophoric. Should an individual cell from a battery becomes disassembled, spontaneous combustion of the negative electrodes is possible. This is much likely to happen if the electrodes is removed from its metal container. There can be between exposure to air and spontaneous combustion.

Charge:

- This battery is to be charged many times. Because it gradually loses its charge over a few months, it is good practice to battery before use. Use recommended charger. Improper charging can cause heat damage or even high pressure rupture. Observe proper charging polarity.

SECTION VII – ACCIDENTAL RELEASE OR SPILLAGE

Steps to be taken in case Material is Released or Spilled ;

- Batteries that are leakage should be handled with rubber gloves.
- Avoid direct contact with electrolyte.
- Wear protective clothing and a positive pressure Self-Contained Breathing Apparatus (SCBA)



SECTION VIII – SPECIAL PROTECTION INFORMATION

Ventilation Requirements:

Not necessary under normal conditions.

Respiratory Protection:

Not necessary under normal conditions

Eye Protection:

Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Open Battery Storage:

Battery should not be opened. Should a cell become disassembled, the electrode should be stored in a fireproof cabinet, away from combustibles.

Keep batteries between – 20°C and 35°C for prolong storage.

When the cells are closed to fully charged, the storage should be between -20°C and 30°C and should be 10-20°C during transportation and with efficient air ventilation.

SECTION IX - EXPOSURE CONTROLS / PERSON PROTECTION

Occupational exposure limits: LTEP		Step
N.A.		N.A.
Respiratory Protection(Safety Type)		
N.A.		
Ventilation	Local Exhausts	Special
	N.A.	N.A.
	Mechanical(General)	Other
	N.A.	N.A.
Protective Gloves		Eye protection
	N.A.	N.A.
Other protective clothing or equipment		
N.A.		
Work/Hygienic practices		
N.A.		

SECTION X – ECOLOGICAL INFORMATION

Not Applicable

SECTION XI – DISPOSAL METHOD

Dispose of batteries according to government regulations.

SECTION XII – REGULATORY INFORMATION

Special requirement be according to the local regulatory.



SECTION XIII – TRANSPORTATION INFORMATION

SES batteries are considered to be “Dry cell” batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation(DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods Regulations (IMDG). The only DOT requirement for shipping these batteries is special provision 130 which states: “Batteries, not subject to the requirements of this sub chapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (For example, by the effective insulation of exposed terminals). 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 XIV – OTHER INFORMATION

The data in this Material Safety Data Sheet relates only to the specific material designated herein.

SECTION XV – MEASURES FOR FIRE EXTINCTION

- In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material.
- Cool exterior of batteries if exposed to fire to prevent rupture.
- Fire fighters should wear self-contained breathing apparatus.