

Ni-MH Material Safety Data Sheet

SECTION I - IDENTIFICATION

Product Name: Nickel Metal Hydride battery

Chemical Systems: Nickel Metal Hydride, Alkaline electrolyte

Designed for Recharge: Yes

SECTION II – COMPOSITION

INGREDIENT	EINECS number	CAS number	Classification under CLP	% Weight
Nickel dihydroxide	235-008-5	12054-48-7	Carc. 1A H350i Repr. 1B H360D Muta. 2 H341 STOT RE 1 H372 Acute Tox. 4 H332 Acute Tox. 4 H302 Skin Irrit. 2 H315 Resp. Sens. 1 H334 Skin Sens. 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	22.7
Cobalt oxide	215-154-6	1307-96-6	Acute Tox. 4 H302 Skin Sens. 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	1.8
Nickel powder	231-111-4	7440-02-0	Carc. 2 H351 STOT RE 1 H372 Skin Sens. 1 H317 Aquatic Chronic 3 H412	5.5
Hydrogen storage alloy	N/A	N/A	Not Classified	34.4
Potassium Hydroxide	215-181-3	1310-58-3	Acute Tox. 4 H302 Skin Corr. 1A H314	4.4
Lithium Hydroxide	215-183-4	1310-65-2	Acute Tox. 4 H302 Skin Corr. 1B H314 Aquatic Chronic 3 H412	0.4
Nickel monoxide	215-215-7	1313-99-1	Carc. 1A H350i STOT RE 1 H372 Skin Sens. 1 H317 Aquatic Chronic 4 H413	0.8
Polypropylene	N/A	9003-07-0	Not Classified	3.4

Iron	231-096-4	7439-89-6	Not Classified	26.6
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Element	Lead (Pb)	Cadmium (Cd)	Hexavalent Chromium (Cr6+)	Mercury (Hg)	Polybrominated Biphenyls (PBBs)	Polybrominated Diphenyls Ethers (PBDEs)
% weight	< 0.004	< 0.002	< 0.1	< 0.0005	< 0.1	< 0.1

SECTION III - HAZARDOUS INGREDIENTS

Chemical contents are sealed in metal can. Therefore, risk of exposure never occurs unless battery is mechanically or electrically abused.

Risk of explosion by fire is anticipated if batteries are disposed of in fire or heated above 100 degree Celsius. Stacking or jumbling of batteries may cause external short circuits, heat generation, in some case, allowing fire or explosion.

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

SECTION IV – FIRST AID MEASURES

Under normal conditions of use the battery is hermetically sealed and release of ingredients does not occur. If accidental release occurs precautions must be taken to avoid personal to get in direct contact with electrolyte.

Inhalation:

Contents of an open battery can cause respiratory irritation. Hypersensitivity to nickel can cause allergic pulmonary asthma. Provide fresh air. Rinse mouth and nose with water. 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:

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

Ingestion:

Swallowing a battery can be harmful. Call your local poison control centre for advice and follow-up.

Contents of an open battery can cause serious chemical burns of mouth, oesophagus, and gastrointestinal tract. If the injured is fully conscious: plenty of drink; preferable milk. Do not induce vomiting. Seek immediately hospital treatment.

SECTION V – FIRE-FIGHTING MEASURES

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

Extinguishing media:

In case of fire where nickel metal hydride batteries are present, apply a smothering agent such METL-X, sand, dry ground dolomite, or soda ash, or flood the area with water. A smothering agent will extinguish burning 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 batteries can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended.

Special exposure hazards:

Nickel metal hydride batteries involved in a fire can vent and produce toxic fumes including nickel, nickel oxide and cobalt oxides.

Special protective equipment

Fire fighters should wear self-contained breathing apparatus and full fire-fighting protective clothing.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Batteries that have released their ingredients should be handled with rubber gloves. Avoid direct contact with electrolyte. Wear protective clothing.

Collect the cells for recycling in a plastic lined container, if necessary use sawdust to absorb electrolyte leakages. Dispose off according to the local law and rules. Beware risk of slipping.

SECTION VII - HANDLING AND STORAGE

Handling:

Always follow safety instructions on the batteries and in the manuals of devices. Only use the recommended type of batteries.

Do not short circuit batteries. Accidental 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 circuits include jumbled batteries in bulk containers, metal jewellery, and metal covered tables or metal belts used for assembly of batteries into devices.

Do not open a cell. The negative electrode material may be pyrophoric. If an individual cell becomes disassembled, spontaneous combustion of the negative electrode is possible. This is much more likely to happen if the electrode is removed from its metal container. There can be a delay between exposure to air and spontaneous combustion.

Charging:

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

Storage:

Store in a dry, cool, well ventilated area. It is recommended following storage conditions: +5 to +25°C in a 65 ± 5% relative humidity. Elevated temperatures can result in shortened battery life.

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

Specific use:

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

SECTION VIII – EXPOSURE CONTROL/PERSONAL PROTECTION

Personal protection is not necessary under normal conditions (charge and discharge) because release of ingredients does not occur.

If handling an open or leaking battery wear safety glasses with side shields and use neoprene or natural rubber gloves

SECTION IX - PHYSICAL / CHEMICAL CHARACTERISTICS

Not applicable if cell is closed.

Appearance is nickel plated steel cylindrical cell, eventually sleeved. Odourless.

SECTION X - REACTIVITY DATA

Nickel metal hydride cells are stable in storage.

In case of storage in humid atmosphere, some rust may appear on the product.

In case of storage in a charged state, cells progressively loose their energy, generating eventually a progressive temperature increase according the thermal insulation efficiency of the packaging.

In case of exposure to temperature over 85°C, a risk of release of alkaline electrolyte mist or liquid is created. A higher temperature (160°C) the plastics used can melt or decompose (Polyamide gasket, rubber valve, PVC sleeve,...).

In case of mechanical deterioration of the cells, active materials contained as powder can be dispersed (Nickel, Cobalt, Zinc, Metal hydride).

SECTION XI - TOXICOLOGICAL INFORMATION

The sealed nickel metal hydride cells as a product are not presenting toxicological hazards. In case of product destruction or opening, the following substances can be released:

Name	Hazards
	Carcinogenicity / mutagenicity / reprotoxicity
Nickel powder	Carcinogenicity cat 2
Nickel oxide	Carcinogenicity cat 1
Nickel hydroxide	Carcinogenicity cat 1A, Mutagenicity cat 2, Reprotoxicity cat 1B
Potassium hydroxide	No data available
Cobalt oxide	No data available
Lithium hydroxide	No data available

Polypropylene	No data available
Iron	No data available

SECTION XII - ECOLOGICAL INFORMATION

The sealed nickel metal hydride cells as a product are not presenting ecotoxicological hazards. In case of product destruction or opening, the substances described in section XI can come in contact of the environment. The metals content in a nickel metal hydride battery are toxics for the environment.

If not recycled, it must be disposed of in accordance with all government regulations.

SECTION XIII - DISPOSAL INFORMATION

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the Directive 2006/66/EC of the European parliament and of the council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC, modified by Directive 2008/12/EC, Directive 2008/108/EC and Directive 2013/56/EU.

Nickel metal hydride cells must be recycled. Importers and users inside EU find detailed information on disposal in their specific countries using the website of the European Portable Batteries Association (http://www.epbaeurope.net/legislation_national.html).

Importers and users outside EU should consider the local law and rules.

SECTION XIV – TRANSPORTATION INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packed in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and contained in "strong outer packaging" that prevents spillage of contents. All original packaging for Fullwat nickel hydride batteries has been designed to be compliant with these regulatory concerns.

Fullwat nickel metal hydride batteries (sometimes referred to as "Dry cell" batteries) are not defined as dangerous goods under the IATA Dangerous Goods Regulations 63rd edition 2022, ICAO Technical Instructions for the safe transport of dangerous goods by air 2021-2022 and the U.S hazardous materials regulations (49 CFR). These batteries are not subject to be dangerous goods regulations as they are compliant with the requirements contained in the following special provisions:

Regulatory body	Special provisions
ADR	295-304, 598
IMO	UN3496, SP117 and SP963
UN	UN3496
US DOT	49 CFR 172, 102 Provision 130
IATA	A199, A123

In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words "not restricted" and the Special Provision number A199 be provided on the air waybill, when an air waybill is issued.

International Maritime Organization (IMO) IMDD code regulated these products as UN3496 BATTERIES, NICKEL METAL HYDRIDE, class 9 dangerous goods with Special Provision 117 and 963 assigned.

SP117 Only regulated when transported by sea.

SP963 Nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in equipment are not subject to the provisions of this Code.

All other nickel-metal hydride cells or batteries shall be securely packed and protected from short circuit. They are not subject to other provisions of this Code provided that they are loaded in a cargo transport unit in a total quantity of less than 100 kg gross mass. When loaded in a cargos transport unit in a total quantity of 100 Kg gross mass or more, they are subject to other provisions of this Code except those of 5.4.1, 5.4.3 and column (16) of the dangerous good list in Chapter 3.2,...

The requirements of these sections are:

1. dangerous goods transport documentation to accompany the shipment,
2. the shipment must be described as "UN3496, BATTERIES, NICKEL-METAL HYDRIDE, CLASS 9" on the shipper's declaration of dangerous goods,
3. the dangerous goods description must also be entered on the Dangerous Cargo Manifest and /or the detailed stowage plan in compliance with IMDG Code requirements of shipboard documentation.

SECTION XV –REGULATORY INFORMATION

Nickel metal hydride batteries are submitted to the European community directive 2006/66/EC for recycling.

These batteries are no "substances" or "preparations" according to REACH 2006/1907/EC regulation. Instead they have to be regarded as "articles", no substances are intended to be released during handling.

SECTION XVI –OTHER INFORMATION

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

The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. They are no contractual assurances of product attributes. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.