



## MATERIAL SAFETY DATA SHEET

### PRODUCT NAME : NICKEL-METAL HYDRIDE (NiMH) BATTERIES

#### 1. Product Identification

Product Description : Nickel Metal Hydride rechargeable batteries, supplied as individual cells or assembled together as battery packs.

Models / Sizes : All

#### 2. Ingredients

Approx. percentage of total weight

Nickel (as Nickel, Nickel Hydroxide & Nickel Oxide)	44.0%
Rare Metal (Hydrogen absorbed alloy)	14.5%
Cobalt Hydroxide (as Cobalt Metal)	6.7%
Manganese	2.4%
Aluminium	1.5%
Hydroxyl, Liquid	1.45%
Potassium Hydroxide	1.3%

Boiling point :	Not applicable	Melting Point :	Not applicable
Vapour Pressure:	Not applicable	Vapour Density :	Not applicable
Specific Gravity :	1.17 – 1.25 (electrolyte)	Evaporation Rate :	Not determined
Solubility in water :	Electrolyte solution is completely soluble Remainder – insoluble		

### 3. Health Hazard Information

All Nickel Metal Hydride cells are manufactured as sealed units. They do not pose a health hazard if kept in a sealed condition and used within their specified operational limits.

The following information is provided to cater for exceptional circumstances only or where the cells have been abused.

The acutely toxic ingredients are Potassium Hydroxide and Nickel compounds.

#### Overexposure to Cell Contents

**Eye Effects :** In the case of a fire or cell rupture the electrolyte solution inside the battery is extremely corrosive to eye tissue and may result in permanent blindness. Contact with nickel oxide may cause minor irritation.

**Skin Effect :** Contact with electrolyte solution inside the battery may cause serious burns to skin tissues. Contact with nickel compounds may result in chronic eczema or nickel itch.

**Ingestion :** Ingestion of electrolyte causes tissue damage to throat area and gastro/respiratory tract. Ingestion of nickel compounds causes nausea and intestinal disorders.

**Inhalation :** No exposure possible except in the case of fire or abuse. Effects of inhalation of nickel compounds vary from mild irritation of nasal mucous membranes to damage of lung tissues.

#### Battery Electrolyte

**Eye Contact :** Flush with plenty of water for at least 15 minutes if abuse causes safety vents to activate. Obtain immediate medical attention.

**Skin Contact :** Remove contaminated clothing and flush effected areas with plenty of water for at least 15 minutes. Wash with soap and water.

**Ingestion :** Do not induce vomiting. Dilute by giving water. Obtain immediate medical attention. Do not give anything by mouth to an unconscious person.

**Inhalation :** Remove to fresh air. Give oxygen or artificial respiration if needed. Obtain immediate medical attention.

## Protection

Eyes : Use splash goggles or face shield if cell vent activates due to abuse.

Skin : If exposure to electrolyte solution, or dried salts is likely, use any water-insoluble non-absorbent glove, i.e., synthetic rubber. Do not use leather or wool.

Respiratory : Use approved respirator if cell broken open during a fire, to maintain exposure levels below the limits for hydrogen absorbed alloy and nickel compounds.

Other Protective Equipment : Rubber apron or equivalent if exposure to electrolyte is likely.

## **4. Safety Hazard Information**

All Nickel Metal Hydride cells are manufactured as sealed units. They do not pose a safety hazard if kept in a sealed condition and used within their specified operational limits.

The following information is provided to cater for exceptional circumstances only or where the cells have been abused.

### Fire and Explosion

Extinguishing Media :

	Melting Point	Boiling Point
Nickel	2645F / 1452C	4850F / 2677C
Nickel Hydroxide	N/A	445F / 229C (Decomposes to NiO)
Nickel Oxide	3605F / 1985C	90F / 32C (Decomposes to Ni and O <sub>2</sub> )

Special Fire Fighting Procedure :

Use self-contained breathing apparatus to avoid breathing toxic fumes. Wear protective clothing and equipment to prevent potential body contact with electrolyte solution or mixture of water and solution.

Fire and Explosion Hazards :

Electrolyte solution is corrosive to all human tissues . It will react with many organic chemicals, especially nitro-carbons and chlorocarbons. Electrolyte solution reacts with zinc, aluminium and other active materials, releasing hydrogen gas. In case of fire, do not take in smoke and fume.

## Spillage

Electrolyte Spill : Flush with water and neutralize with dilute vitriol.

## **5. Precautions and comments**

Nickel Metal Hydride cells and batteries may be highly charged and capable of high energy discharge. Care should be taken to handle these products properly to avoid shorting or misuse that will result in rapid uncontrolled electrical, chemical or high energy release.

Always use the products within their specified operational limits. Use outside these limits may result in leaking, venting, fire or explosion.

Do not solder directly to the cells or batteries or otherwise overheat.

Do not fit cells or batteries in a sealed enclosure.

Do not mix with batteries of other chemistries, e.g. nickel cadmium.

Do not short circuit - may cause burns or fire.

Do not incinerate - may burst or release toxic materials.

## Transportation

Nickel Metal Hydride cells and batteries are considered to be 'dry cell' products which are unregulated for the purpose of transportation. The only requirement for these products is when shipping by air where IATA Special Provision A123 states ' An electrical battery or battery powered device having the potential of dangerous evolutions 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 transportation. Sensibly, the same requirements should be applied when shipping these products by land or sea.

## Disposal

At the time of issue of this data sheet there were no regulations in force within the UK covering disposal of Nickel Metal Hydride cells and batteries. For environmentally friendly recycling / disposal contact a specialist waste disposal company.

COSHH (Control of Substances Hazardous to Health) Regulations, 1998

Nickel Metal Hydride cells and batteries are not substances hazardous to health within the meaning of these regulations.

This Health and Safety Data Sheet was issued on 2<sup>nd</sup> June 2005 and supersedes all earlier issues.

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NiMH/MSDS/A