MATERIAL SAFETY DATA SHEET

Date: 5.January.2009

Section I – Product Identification

Product Name: **Nickel Metal Hydride (NiMH) Battery**
Trade Name**: All Types in Steel Container** IEC Designation: HR… According to IEC 285
Chemical System: **NiMH, Alkaline Electrode** Designated for Recharge: **_X_** Yes __ No
Positive Electrode: **Nickel Hydroxide** Negative Electrode: **Metal Hydride**
Electrolyte: **Potassium Hydroxide Water Solution** Nominal Voltage: **1.2V**

Section II – Product Composition

Metals % Plastics % Other %
Iron Fe 23 – 27 Polypropylene PP 2.5 – 3.5 Potassium K 1.8 – 2.5
Nickel Ni 17 – 23 Rubber EPDM < 0.05 Water H2
O 4 – 7
Metal
Hydride MH 23 – 35 Polyethylene PE 0.2 – 0.4 OH- 9 – 11
Cobalt Co 0.4 – 1.0 PVC 0.5 – 0.7
MSDS - Sealed NiMH Page 2 of 5

Section III – Hazards

A sealed Nickel-Metal Hydride cell is not hazardous on principle.
Physical:
No risk if cells are used for its intended purpose and according to valid directions for use.
Chemical:
In normal use, no chemical risk
On some extreme conditions (high over charge, reverse polarity, external short circuit, etc) and in case of manufacturing defect, some electrolyte can be removed from the cell by the safety vent. In these cases, the risk is the caustic nature of electrolyte.
The toxic properties of the electrode materials are hazardous only if the materials are released by damaging the cell or if exposed to fire.
Classification of dangerous substances contained into the cells.
SUBSTANCES CLASSIFICATION
Name: EEC No. Symbol: Letter Identification
of Danger
Special Risk
(1)
Safety Advice
CAS No. (2)
Nickel
Hydroxide
028-008-X* Ni(OH)2 Xn Harmful R 20/22-43-
12054-48-7 40 S 22/36
Cobalt
Hydroxide
21041*- 93-0 Co(OH)2 Xn Harmful R 22-42/43 S22-24-37
Potassium
Hydroxide
01193-1000-25-80-03- 8 KOH C Corrosive R 35 S 26-37/39-45
(1) Nature of Special Risk:
R 20/21/22: Harmful by inhalation, skin contact, or if swallowed
R 20/22: Harmful by inhalation or if swallowed
R 35: Causes serious burns
R 40: Possible risk of irreversible effects
R 43: May cause sensitizing by skin contact
R 42/43: May cause sensitizing by inhalation and skin contact
(2) Safety Advice:

S 22: Do not breath dust
S 24: Avoid contact with skin
S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S 36: Wear suitable protection clothing
S 37: Wear suitable gloves
S 37/39: Wear suitable gloves and eyes/face protection
S 45: In case of accident or if you feel unwell, seek medical advice immediately

Section IV – First Aid Measures

In case of electrolyte leakage, precautions must be taken to avoid personnel to get in direct contact with it. If it leakage occurs, the following must be done:

Inhalation:
Fresh air, rinse and nose with water. Seek medical treatment

Skin contact:
Rinse immediately with plenty of water. Seek medical treatment

Eye Contact:
Rinse immediately with plenty of water for a minimum of 15-30 minutes. Seek medical treatment

Ingestion:
If the injured is fully conscious, do not induce vomiting – drink milk. Seek medical treatment

Section V – Health Hazard Data

Extinguishing Media:
Suitable Class D-Dry chemical, sand. Do not use water

Special Exposure Hazards:
Cells can be over heated by an external source or by internal short circuit and develop Potassium hydroxide mist and/or hydrogetn gas. In fire situations fumes containing Nickel, cobalt, and iron may evolve.

Special Protective Equipment:
Use self-contained breathing apparatus and full fire-fighting protective clothing

Section VI – Handling and Storage

No hazards during handling, no electrolyte can pour out of the sealed, NiMH cells.
Storage specifications: +5 to +25°C in a 65 +/- 5% relative humidity.

Section VII – Exposure Controls/Personal Protection

Under normal conditions of use and handling, no special protection is required for sealed NiMH cells.

Section VIII – Physical Properties

Appearance:
Physical Shape and color as supplied.

Temperature Range:
Continuous: +5 to + 25°C
Occasional: -40 to + 50°C

Specific Energy:
Wh = Nominal Voltge x Rated Ah as Defined in IEC Standard
Kg = Average Battery Weight in Kg
65 to 75 Wh/Kg

Specific Instant Power:
W = 0.5 x Nominal Voltage x Ip
Ip = Amperes Delivered by a Fully Charged Battery for ½ Nominal Voltage at 1 Second
Kg = Average Battery Weight in Kg
1500 W/Kg

Mechanical Resistance:
As defined in relevant IEC standard.

Section IX – Stability and Reactivity

Conditions: Temperature over 85°C, Internal Short, Melting of gasket and rubber vent
Hazardous Decomposition Products: Nickel Compounds, Cobalt Compounds, Caustic Liquid

Section X – Toxicological Information

Nickel Hydroxide LD50/oral/rat: 1600 mg/Kg
Potassium hydroxide LD50/oral/rat: 365 mg/Kg
Cobalt Hydroxide LD50 Not available

Section XI – Ecological Information

Nickel Metal Hydride (NiMH) cells contains no cadmium, no mercury, no lead, and no toxic metals.