PRODUCT SAFETY DATA SHEET

Manufacturer

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Name of product : Nickel-Metal Hydride Storage Battery
(Model Name) The models described as HHR-*****

Substance Identification

Substance : Nickel-Metal Hydride Storage Battery
CAS No. : Not Specified.
UN Class : Classified as UN3028, but they are exempted from Dangerous Goods pursuant to UN Special Provision as below.
Not restricted, as per Special Provision A123

[Special Provision 304] (UN Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations Volume 1. 15th revised edition)

Battery, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to these Regulations provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are : alkali-manganese, zinc-carbon, **nickel-metal hydride** and nickel-cadmium batteries.

Composition

Common Chemical name	CAS number	Concentration/ Percentage Range
Nickel Hydroxide Cobalt Hydroxide	12054-48-7 21041-93-0	15-25% 1-5%
Hydrogen absorbing alloy	7440-02-0(Ni) 7440-48-4(Co) 7439-96-5(Mn) 7429-90-5(Al)	20-35%
Nickel	7440-02-0	3-10%
Iron	7439-89-6	10-25%
Potassium Hydroxide Sodium Hydroxide Lithium Hydroxide	1310-58-3 1310-73-2 1310-65-2	0-15%

Hazardous and Toxicity Class:

Class name : Not applicable

Hazard : In case of battery shortage, there is possibility of heat up of battery and/or leakage.

Toxicity : In case of burning of plastic parts there is possibility of gas generation, which has toxic for eyes, nose and throat.

First Aid Measures

In case of electrolyte leakage from the battery, necessary actions to be taken are described as follows.

Eye contact : Flush the eyes with plenty of clean water such as tap water for more than 15 minutes without rubbing and immediately take a medical treatment.
If appropriate procedures are not taken, it may cause a loss of sight.

Skin contact : Wash the contact skin area off immediately with plenty of clean water such as tap water using soap, otherwise it might cause sore on the skin.

Inhalation : Move the exposed person to fresh air area immediately.
And take a medical treatment immediately.

Fire Fighting Measures

1. Suitable fire extinguishing media are dry sand and chemical powder fire extinguisher.
2. When in firefighting, the air respiratory protection should be used because acrid or harmful gas might be generated when fire is extinguished.
3. Remove combustibles at once from a firefighting area.
4. Remove the batteries to safe area at once from firefighting place.

Measures for electrolyte leakage (Accidental release measures)

(When the electrolysis liquid leaks from the product)

1. Wiping it off with the dry towel.
2. The fire should not be brought close to it.
3. The protection glasses and rubber gloves are put on if necessary.

Handling and Storage

1) The terminals of the battery pack should be protected in the packing form to be able to prevent them from external short circuit.
2) They are packed by the material with enough strength to prevent them from destroyed by vibrates, impact, fall and accumulation, etc. while transporting them.
3) Keep batteries out of water and wet when in storage and transported.
4) Keep batteries out of fire and avoid the high temperature atmosphere when in storage and transported.

An example of the high temperature : The high temperature storage like in the car exposed to blazing sun should be avoided.

Exposure control (in case of electrolyte leakage from the battery)

Acceptable concentration	: Not specified in Japanese industrial hygienic association and ACGIH
Facilities	:Ventilation should be noted such as equipped with the limited spot area exhaust device used for the battery storage place.
Protective clothing	: The protection glasses, the mask for disaster prevention, and the protection gloves are used.

Physical and Chemical Properties

Externals : The nickel hydrogen storage battery is stored in the plastic resin case or tube. The voltage value depends on the number of built-in batteries used in battery pack.

Stability and Reactivity

The external short, the crushing transformation, and the high temperature exposure of 100℃ or more cause abnormal heat generation and the fire.

Toxicological information

When the electrolyte leaks from the product

Acute toxicity : LD50 2g/Kg oral rat
(Based on material safety data sheet of liquid potassium hydro oxide)

Stimulation : The cornea inflammation is caused when the electrolyte gets in eye.
The long time exposure to the electrolyte stimulates mucous membranes of the bronchial tube and eye.

Ecological Information

Heavy metal quantity for cell

Hg	<	0.5ppm	Measurement Analysis: Atomic Absorption Spectrometer
Cd	<	5.0ppm	Measurement Analysis: Atomic Absorption Spectrometer
Pb	<	40ppm	Measurement Analysis: Atomic Absorption Spectrometer

Disposal Considerations

When the battery is worn out, dispose of it under the ordinances of each local government or the related laws and regulations.

Transport Information

1. During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to dew condensation.
2. Avoid transportation with the possibility of the collapse of cargo piles and the packing damage.
3. Protect the terminals of batteries and prevent them from short circuit so as not to cause dangerous heat generation.

Regulatory Information

- IATA Dangerous Goods Regulations 51th Edition Effective 1January-31December 2010
- ICAO Technical Instructions for the safe transport of dangerous goods by air
- IATA(A123) for air shipment and IMDG(Special Provision) for sea shipment under UN3028

Others

References

- Ni-Cd, Ni-MH Panasonic Catalogue and technical handbook.
- MSDS of Nickel hydro oxide and potassium hydro oxide and sodium hydro oxide from supplier.
- Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations Volume 1. 15th revised edition.
- IATA Dangerous Goods Regulations 51th Edition Effective 1 January – 31 December 2010
- Technical Instructions for the Safe Transport of Dangerous Goods by Air
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